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What Was New Music: Arrigo and Bartók in Lourenço

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Resumo

Os excertos de Eduardo Lourenço sobre *Thumos* de Arrigo e *Música para Cordas, Percussão e Celesta* de Bartók têm múltiplas implicações, tanto estruturais como de significado. Discutimos o conceito apresentado por Lourenço de 'tempo em reverso', tanto na perspectiva da teoria da música, assim como das interpretações que apresenta, na década de 1960, sobre o modernismo que pareciam tão distintas das interpretações 'clássicas' na arte musical. Tal como Adorno, seu contemporâneo, apresenta a ideia de que a 'música nova [moderna] cintila num instante', a qual é possível exemplificar através dos *ostinati* nas obras de Arrigo. Estas técnicas, como propomos neste artigo, estimularam em Lourenço o conceito de música que nos leva 'do futuro para o passado', uma música que experienciamos na 'profundidade das nossas origens'. Em Bartók, Lourenço encontra paradoxos, como a 'velocidade congelada', inspirados pela tensão entre a experiência do processo musical e as suas particularidades e implicações estruturais. Debruçamo-nos em três aspectos relevantes na análise musical: (1) como o arco de entradas em quinta perfeita gera uma estrutura de alturas em tempo real multifacetada; (2) como estas relações multifacetadas são detalhadas no 'novo cromatismo' das entradas do sujeito ao longo da fuga; e (3) como as relações, entre os níveis macro (da forma) e micro (do sujeito), evocam construções de classes de altura de padrões periódicos concebidos como fora do tempo (sincrónicos), a que chamamos de *espaços de afinidade*. Recuperando um paralelismo há muito perdido, partimos de *Thumos* actualmente relativamente marginalizada, e resistente a formulações contemporâneas da análise musical, e a obra de Bartók agora considerada 'clássica' e não problemática em diversos sentidos, embora continue a revelar relações musicais surpreendentes. Estas obras chegaram a Lourenço, de modo idêntico e modernista, como um 'lugar' de 'incoerência supremamente coerente […] de um universo totalmente deserto'.

Palavras-chave

Tempo musical em reverso; Música em Eduardo Lourenço; Girolamo Arrigo; *Música para Cordas, Percussão e Celesta*; Espaços de afinidade

Abstract

Lourenço's fragments about Arrigo's *Thumos* and Bartók's *Music for Strings, Percussion and Celesta* are richly implicative. We discuss what Lourenço calls 'time in reverse,' both from a music theory perspective and as to how his 1960s interpretations of modernism seemed so distinct from interpretations of the 'classical' in art music. Like his contemporary Adorno, he offers the image of 'new music lighting up on the

spot', Arrigo's *ostinati* being compositional examples. Techniques of that kind, we propose, stimulated Lourenço's concept of music taking us 'from future to past,' music in which we live in 'the abyss of our beginnings.' In the Bartók, Lourenço finds paradoxes, such as 'frozen velocity,' that are inspired by the tension between the experience of musical process and its structural conditions and implications. We focus on three pertinent music-analytical aspects: (1) how the arch design of perfect-fifth entries creates a real-time, multivalent pitch structure; (2) how these multivalent relations are telescoped into the 'new chromaticism' of each subject statement; and (3) how relations between micro-level subject and macro-level arch form invoke the organization of certain out-of-time, that is, synchronic, periodic pitch structures, which we theorize as *affinity spaces*. Recovering a long-lost comparison, we drill down from *Thumos* in contemporary terms as relatively marginal, and unsurprisingly resistant to contemporary music-analytical explanation, and Bartók's masterpiece as now regarded as 'classic' and in many senses unproblematic. These works came over contemporaneously to Lourenço as equally and fundamentally modernist, a site of the 'supremely coherent incoherence […] of a vacant universe.'

Keywords

Reverse musical time; Music in Eduardo Lourenço; Girolamo Arrigo; *Music for Strings Percussion and Celesta*; Affinity spaces.

> Classical music—meaning everything almost up to Schoenberg—moved towards somewhere, or would move in a clearly infinite space. This space was destroyed by Debussy thinking musically in terms of crossing, superimposed, or labyrinthine spaces, but it is always clearly woven, just in a more complex way and, as it were, open at both ends.
> *New Music* lights up on the spot in whatever space or non-space it has created and needs to exist. Above all, though, it literally creates what previously seemed the starting point, the *past*. It is as if the music jumped straight into its own future, and from there discovered the past in its future, always returning to its impossible origin; as if it inhabited an *immanent eternity*. Within this glorious place which is over before it has begun, music creates all time in reverse: future to past, always. It is as if we had renounced the face of God forever and gone crazy with nostalgia on the way to the abyss of our beginnings. Schumann's perdition happened in the forest of Pan. Ours happens in our own illuminated desert-forest. Haunting pathos in Schumann has become materially and cosmically where we actually live, and not some celestial prison. Leaving it or heading for it […] no longer makes any sense. We are where we are, and where we are is dazzling, sad, *andante* like Girolamo Arrigo's *Thumos*.[1]

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[1] 'La musique classique—et tout est classique jusqu'à Schönberg presque—allait vers quelque part ou parcourrait un espace clairement infini. Cette espace, Debussy le détruit pensant musicalement en terme d'espaces qui se croisent, se superposent, se labyrintisent mais toujours formant une trame simplement plus complexe et comme ouverte des deux côtés.
La nouvelle musique fulgure sur place, elle crée l'espace ou le non-espace dont elle a besoin pour être. Mais surtout elle crée litteralement ce que jusqu'à present semblait le point de départ, *le passé*. Tout est passé comme si la musique s'installait d'emblée dans son propre future et, à partir de là, elle s'inventait le passé de son futur revenant sans fin vers ses impossibles commencements ou comme si elle s'installait d'emblée dans une *éternité immanente*. À l'intérieur de cet espace glorieux dejà fini et encore pas commencé, elle s'invente *tous* les temps dans l'ordre inverse: toujours de l'avenir vers le passé. C'est comme si nous avions renoncé à jamais au visage de Dieu et nous revenions fous de nostalgie en route vers l'abîme de nos commencements. La perdition de Schumann avait lieu dans la forêt du Dieu-Nature. Celle-ci a lieu dans le désert illuminé de notre propre forêt. Le pathétisme lancinant de Schumann est devenu celui des choses et du cosmos tout entier définitivement, notre *demeure* et pas notre céleste prison. Aller au-delà ou vers [...] n'a plus de sens. Nous sommes chez nous, un 'chez nous' resplendissant, triste, *andante* comme ce *Thumos* de Girolamo Arrigo'. Eduardo LOURENÇO, '4.16 Debussy, Schumann, Arrigo, 24-03-1966', in *Tempo da música, música do tempo*, organization and preface by Barbara Aniello (Lisboa, Gradiva, 2012), p. 151; emphasis original; authors' translation.

EDUARDO LOURENÇO IS WEAVING A DAZZLING NARRATIVE; one may say also complex, or perhaps complicated to the minds and ears of some. No writer pens such ideas without intending to provide a deeply self-reflexive account of musical experience—about renouncing the face of God, discovering the past in the future, a potential oxymoron such as the dazzlingly sad, and especially his central idea here of time being musically creatable in reverse. It may seem a long, possibly weary road from speculative insights of that kind to the practice of music analysis, of what music analysis claims. And yet, whereas for some Lourenço's text might merely consist of subjective responses to amateur listenings with little validity beyond individual musings, an empathic reading also encourages us to confront a bold critical view that approaches historical dimensions of musical works through a phenomenological approach, convoking his and our experiential and interpretive responses to music's differing sound organizations and styles.[2]

In this article we frame Lourenço's critical attitude by exploring two sorts of angles or tensions: the first is the gulf between aesthetic-historical significance and the methods and claims of particular analytical projects; the other is the potential to interpret musical events both as (objective or inter-subjective) empirical data but, equally, as phenomena or acts of the listener's consciousness. Our goal is to contribute to an outlook on criticism that embraces questions of larger significance but also asks technically relevant questions. The result, we believe, is a more powerful heuristic tool for music

[2] Lourenço discusses his aesthetic position towards the understanding of (new) music and art by drawing upon the interdependence of phenomenology and history, where the musical experience emerges as a meeting 'place' between music and auditor, a 'dialogue' which convokes past, present, and future. He notes: 'The area of a pure, virginal meeting between an *intemporal consciousness* and the pure presence of the work is the meeting of two mirrors sending without end an empty image to each other. History without Phenomenology is blind, Phenomenology without History is empty.' ['A zona de um encontro puro, virginal, entre uma *consciência intemporal* e a pura presence da obra é o encontro de dois espelhos se reenviando sem fim a nula imagem que um ao outro se reenviam. A História sem Fenomenologia é cega, a Fenomenologia sem História é vazia']. See LOURENÇO, *Tempo da música* (see note 1), pp. 144-5: '4.10 *Desintrodução à estética*. Henry Barraud, *Quatuor à cordes*, 1-1-1965'. The last sentence is a reference to Kant's 'togetherness principle' discussed in the *Critique of Pure Reason* on the relationship between concepts and intuitions: 'thoughts without content are empty, intuitions without concepts are blind'. In a book published at the close of the past century, discussing the identity and 'destiny' of Portugal, Lourenço reformulates this relationship as: 'mythology without history is empty and history without mythology is blind'; see Eduardo LOURENÇO, *Portugal como destino seguido de mitologia da saudade* (Lisboa, Gradiva, 1999), p. 14.
Translations of Eduardo Lourenço's voluminous writings (in Portuguese and French) into English are scarce. For the interested Anglophone, the following publications offer translations of selected articles and include excellent introductory notes to the critical and philosophical thinking of the author: Eduardo LOURENÇO, *This Little Lusitanian House: Essays on Portuguese Culture*, selection, translation and introduction by Ronald W. Sousa (Providence - RI, Gávea-Brown, 2003); and Eduardo LOURENÇO, *Chaos and Splendor and Other Essays*, edited by Carlos Veloso (Massachusetts, University of Massachusetts Darmouth, 2003).

analysis than 'impartial' analytical methodologies, which often implicitly rely on larger critical claims while failing to question them.

We shall chart that approach here via modernist scores by Bartók and Arrigo respectively. They will be examined, however, in reverse chronological order, much in the spirit of Lourenço's untrammeled temporality, and inspired by his specific commentaries on the music, richly implicative as they are, yet crying out for interpretation and exemplification. In the first half of this article we shall restrict discussion to relatively general points about temporality and musical space, probing how some significant aspects raised by Lourenço's text can be interpreted through various claims of established analytical methodologies, and closing the section by plundering Arrigo's *Thumos* for emblematic musical examples of the kind of cases which may have informed Lourenço's perception of the 'new' in what was for him new music; and in the second half provide a much more intense exploration of musical space in another, earlier modernist work that Lourenço was moved to write about, Bartók's *Music for Strings, Percussion and Celesta*. Here, we closely investigate how matters of spatial musical structure in the first movement, which are well established in the analytical reception of the piece, engage with temporal phenomena suggested in Lourenço's musings, and we propose a new conceptual framework for understanding time and pitch relations of differing formal significance in the piece.

For the music theorist, there are immediate traces of familiarity in Lourenço's accounts. We comment initially on a fairly dim but topical such trace, and secondly on a luminous but neglected one.

The idea of time in reverse is in fact an everyday and urgent concern of the music analyst. It might surprise scholars in other disciplines to realize how seemingly existentially challenging even the most humdrum music theory inevitably is. Yet one hopes that it is not off-putting to apply the word 'dim' to this phenomenon, for two reasons. First, the phenomenon is so utterly routine, whether in beginners' theory class or at the highest levels of aesthetic speculation about music. The music student may be taught, for example, that in tonal theory a tonic chord in 6/4 position *is* designated I but if it is followed by a dominant chord then it will have to *have been* designated V: the student is confronted by a precise if trivial cameo of what Lourenço describes so eloquently, music creating time in reverse.

In the larger view, secondly, semiology has been particularly good at helping musicians to cope intellectually with this kind of inevitable feature of thinking about music—as opposed to just listening to it, if that is a meaningful category. Without reflection on music, it would never be composed or performed, and thus a preoccupation with so-called 'pure' musical listening, in real musical time, is

usually the preserve of dilettantes and psychologists.[3] Note however that the innocent musical ear can be a preoccupation of even would-be elevated musical discourse: Lawrence Kramer's widely discussed idea of 'songfulness' as 'just singing', to which he attributes the effect of 'immediate recognition' in the listener, is clearly conceived of as a highly valued and uni-temporal phenomenon.[4] Semiology put on the agenda a hundred years ago the distinction between synchronic and diachronic structure, thematizing a distinction as old as Ancient Greek words for time. It did so in a way which many music analysts have found to be convenient, given a malleable concept of musical structure which is said to be the same thing whether you are looking at it all at once, or at parts of it all at once as in the reality of the musical moment. True, this is saying nothing more than Francis Bacon does in his essay 'Of Beauty', that 'a man shall see faces, that, if you examine them part by part, you shall find never a good; and yet altogether do well'.[5] And we would be perfectly happy to accept that one barely needs the semiological jargon to name what music analysis has always practised, alongside its sister hermeneutical disciplines such as literary criticism. However, the issue of the time of music seems to be very much alive in music-analytical circles. A recent version of it is found in Janet Schmalfeldt's book *In the Process of Becoming: Analytic and Philosophical Perspectives on Form in Early Nineteenth-Century Music*.[6] This relies on a theory which may be effectively summarized as 'retrospective reinterpretation' of a musical idea 'within the larger formal context' (p. 9). Again, such a position is of course entirely traditional; one may even say that only such a settled epistemological landscape as that of American music theory could find it tenably interesting.

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[3] The interplay of 'reflection' on music and in-time 'pure' listening suggested here echos Lourenço's distinction between merely feeling music (*sentir*) and understanding it (*compreender*). He notes: 'Nothing more appropriate than music to justify the abyss between feeling it and understanding it. It is obvious that most listeners of Bach don't understand his music: they feel it, they make a whole with it at the moment of hearing it and nothing else. And that happens to them in all musical expressions. Feeling [*sentir*] is the smallest degree of appropriation: it is only to listen with the possible feeling of pleasure, displeasure, enjoyment, or boredom; in short, it is listening by liking or not liking. [Ora nada mais propício do que a música para justificar o abismo que há entre senti-la e compreendê-la. É evidente que a maioria dos ouvintes de Bach não compreende a sua música: sente-a, faz um todo com ela no momento em que a ouve e nada mais. Mas isso acontece-lhe com toda a expressão musical. Sentir é o grau ínfimo da apropriação: é só um ouvir com os sentimentos possíveis de prazer, desprazer, deleite ou aborrecimento, em suma, um ouvir gostando ou não gostando.] See LOURENÇO, *Tempo da música* (see note 1), p. 60: '1.16 Ora nada mais propício do que a música'. This distinction is also akin to Karol Berger's categories of 'process' and 'work' to refer to the contrasting modes of musical experiencing music. The experience of what he refers as 'process' draws an 'attitude of passive identification with the music', whereas 'work' encourages an 'attitude of active contemplation form a certain distance', see Karol BERGER, *A Theory of Art* (New York, Oxford University Press, 2000), pp. 116-9. In this context, David Lewin argues for the multidimensionality of musical experience as something we perceive, understand, and also do; see David LEWIN, 'Music Theory, Phenomenology, and Modes of Perception', *Music Perception* 3/4 (1986), pp. 327–92.

[4] Lawrence KRAMER, *Musical Meaning: Toward a Critical History* (Berkeley, University of California Press, 2002), p. 53.

[5] Francis BACON, *Essays or Counsels Civil and Moral* (London, Odhams Press, 1936), p. 147 (originally published 1597).

[6] Janet SCHMALFELDT, *In the Process of Becoming: Analytic and Philosophical Perspectives on Form in Early Nineteenth-Century Music* (Oxford, Oxford University Press, 2011).

The luminous but neglected trace to be found in Lourenço's words is his idea of new music lighting up on the spot, and 'in whatever space or non-space it […] needs to exist'. We say 'neglected' because music analysis in general is so teleological. It seems not to be in its nature to be aiming to seize the immanent meaning of music rather than its structural coherence, and recent preoccupations such as sonata theory[7] and musical narrative[8] have served to reinforce that characteristic. Yet musical commentary has been there before, in Adorno's remarkable imagery, for one example, when he enlarges on the immanence of structure, in Schubert particularly, but with a much wider validity in music-analytical understanding, as we know if only from his phrase 'like truth in representation'—this is a timeless quality Adorno is identifying in a specific case:

> Now we can see the meaning of our discussion of the image as 'struck': it is struck both like a marksman's target, and like truth in representation; in the way that a photograph is a 'true' likeness when it really looks like someone, Schubertian inspirations are good 'shots' of their perennial models, the traces of whose eternity is often pretty well preserved, as if they themselves had already existed and were simply being discovered; but also they enable the wanderer to march into the region of truth as decisively as only a sharp-eyed marksman can. Either shot happens in an instant, lit up as if by lightening—you know it is over the moment you see even a wisp of it.[9]

In subsequent sentences, Adorno refers to 'our abstract urge for pure formal immanence', suggesting—to the present writers at least—that Adorno, like Lourenço, is thinking of an out-of-time concept of music, although in the one case specific—Schubert—and in the other, Lourenço's idea of the 'new', in a breathtaking generalization that we shall now consider.[10]

What exactly, one wonders, does Lourenço mean by 'new' music as opposed to 'La musique classique'? If the latter is, as he states, music 'almost up to Schoenberg', then it is hard indeed for a twenty-first century theorist to recover a sense of the antithesis he is offering, as if in general Western art music composed since about December 1899 became somehow existentially different—when

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[7] The classic exposition of sonata theory is James HEPOKOSKI and Warren DARCY, *Elements of Sonata Theory: Norms, Types, and Deformations in the Late Eighteenth-Century Sonata* (New York, Oxford University Press, 2006).

[8] See the pioneering volume by Byron ALMÉN, *A Theory of Musical Narrative* (Bloomington, Indiana University Press, 2008).

[9] Theodor ADORNO, 'Schubert 1928', *Nineteenth-Century Music*, 29/1 (2005), p. 11.

[10] Adorno was writing in an age when ideas about imaginary time and especially about the reversal of time were notably current, but it is probably fair to observe that his view of the nature of temporal motion was conventional. For a detailed discussion of musical time in an early twentieth-century modernist perspective, see David TRIPPETT, 'Composing Time: Zeno's Arrow, Hindemith's Erinnerung, and Satie's Instantanéisme', *The Journal of Musicology*, 24/4 (2007), pp. 522-80.

Schoenberg completed *Verklärte Nacht*, the work which may have inspired this page of Lourenço's thoughts on modernism.[11] Yet undoubtedly Lourenço closes in roughly his musical present: Arrigo's *Thumos* is a single-movement work for winds and percussion of which Lourenço may have heard the Paris premiere.[12] The Arrigo score has not one single indication of *andante*,[13] but on the other hand it is a uniformly *lento misterioso* composition, to take the lead from its opening tempo marking, which also states 'tutti sempre *ppp* e senza accenti', with perhaps a kind of underlying slow pulse reminiscent of gamelan periodicity which was of such interest at the time in Parisian classical music circles, and anticipating a well-known feature of Harrison Birtwistle's works from the late 1960s to this day.[14] 1964 was also, as is well known, the heyday of discussions among European composers about new concepts of time, of 'Moment' form in particular which Stockhausen had begun to exemplify, and talk about, in the previous four years. This was not a localized compositional idea but a signature feature of the golden age—often referred to as the Darmstadt period—of avant-garde composition. It was eventually to be theorized as if it could be expected to become a permanent feature of Western art music. Certainly that is the impression which Jonathan Kramer enshrined in scholarly thinking, somewhat quaintly, we may nowadays feel,[15] as a difference between 'linear' and 'non-linear' time, the latter being a great discovery of the later twentieth century, with ancestry, supposedly, in such canonical figures, among the generation prior to Arrigo's, as Messiaen and Stravinsky.[16]

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[11] In some modern Schoenberg studies, this composer's breakthrough is dated not from January 1900, but 1911: see Ethan HAIMO, *Schoenberg's Transformation of Musical Language* (Cambridge, Cambridge University Press, 2006). Lourenço's specific comments on *Verklärte Nacht* are at 4.18, p. 153.

[12] Girolamo Arrigo completed *Thumos* in April 1964. The score was published in 1967 by Heugel in Paris, catalogue number H.31.799, publisher's number P.H. 267. Some library catalogues list this work at 'about 14 minutes', no doubt because that is what is stated in the published score; however, there is a recording of the Paris premier given by the RTF (French radio and television) Orchestra, conducted by Michael Gielen, which finishes at 17'14‴. In the score Arrigo, quoting from the Larousse *Dictionary of the Twentieth Century*, explains that *Thumos*, 'is one of the three parts of the soul […] which Plato compares to a lion, residing in the heart: it is courage. It lies between desire […] and thought' (translated here).

[13] Cf. Lourenço's final sentence, in epigraph.

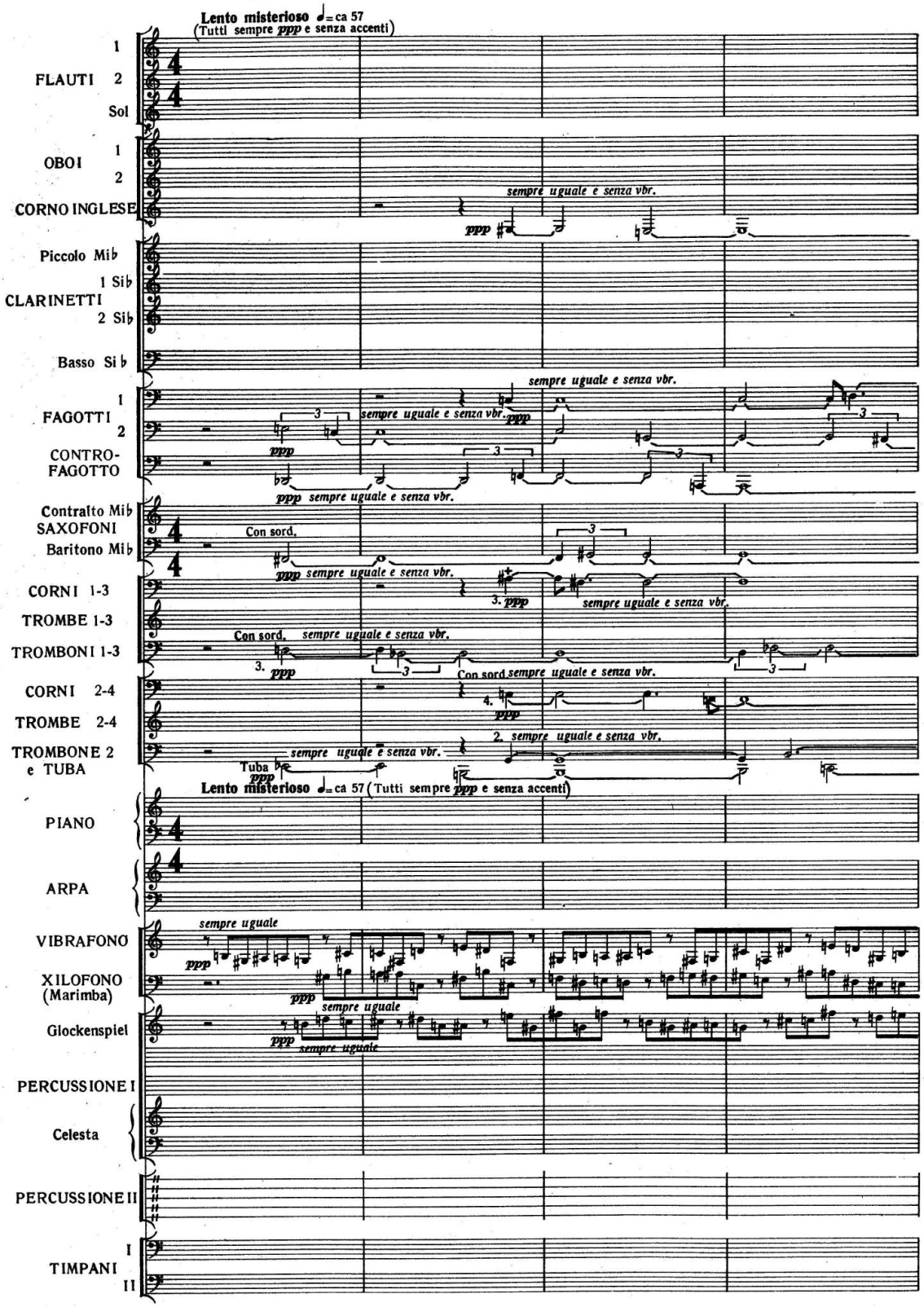
[14] Arnold WHITTALL uses the term 'pulsed music' in 'The Mechanisms of Lament: Harrison Birtwistle's "Pulse Shadows"', *Music & Letters,* 80/1 (1999), p. 86.

[15] Kramer's notion of hemispheric functional separation of the brain as a way of understanding different modes of musical cognition is very much of its era. To say, pseudo-scientifically, that 'since the two hemispheres do communicate, it is entirely reasonable to suggest that many of the tensions of certain tonal compositions come from the apparent contradictions between their two kinds of time' (151) is like saying that 'since the left and right hands of a pianist are connected it is entirely reasonable to suggest that many of the perceptions of depth and height of register in piano music come from the apparent difference between low and high frequencies of sound', or some such. In any case, lateralization of the human brain is universally recognized in modern science to be little understood in relation to human behavior; 'left' and 'right' brain metaphors which circulated in late twentieth-century journalism are nowadays regarded as essentially meaningless.

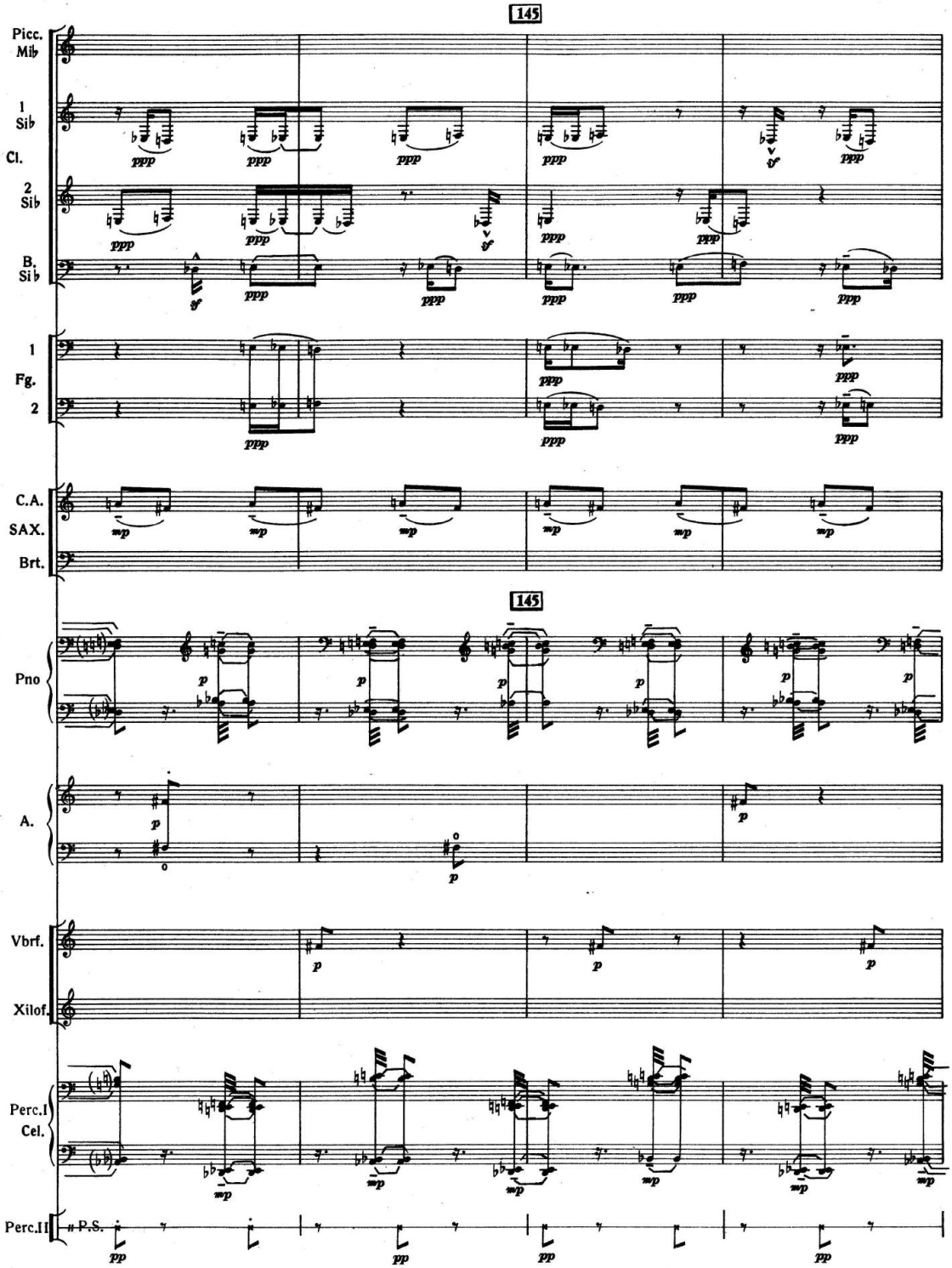
[16] Jonathan KRAMER, *The Time of Music* (New York, Schirmer Books, 1988), particularly chapter 8: 'Discontinuity and the Moment', pp. 201-20. As a matter of detailed history, Martin IDDON rightly declares that the Darmstadt culture was 'essentially over' by 1960, *New Music at Darmstadt: Nono, Stockhausen, Cage, and Boulez* (Cambridge, Cambridge University Press, 2013), p. 286.

On the face of it, one may well wonder whether Kramer put his finger on the kind of conceptualization of musical time about which Lourenço is musing in his lead up to mention of *Thumos* as an emblem of then-modern 'immanent eternity'. Kramer's definitions might work as music-analytical technology for parsing such a piece of music, linear time in music meaning 'the determination of some characteristic(s) of music in accordance with implications that arise from earlier events of the piece', in contrast to non-linear implications 'that arise from principles or tendencies governing an entire piece or section'.[17] In such a reading, the athematic, sectionalized, heterogeneous nature of *Thumos* would undoubtedly warrant the diagnosis of non-linear musical time in the sense that direct derivation of ideas does not seem to be its esthesic intention, even if to some extent that was its poietic stimulus. For example, we can identify at least four places in *Thumos* where, however we may characterize its forms of musical continuity elsewhere, something different and intermittently consistent arises, that is, ostinato. It would have intrigued Lourenço, given the foundational role in modernism that he ascribes to Debussy's 'compositional space […] open at both ends', to read in Derrick Puffett's essay about that composer's discovery of the ostinato how 'such structures tend to assume a kind of autonomy, unfolding alongside, or even in opposition to, whatever mode of organisation prevails for the piece as a whole'. In Example 1.1, the groups of notes in pitched percussion are essentially repetitive if not literally ostinatos, and of course imitative, with the glockenspiel inevitably coming to the fore aurally. Example 1.2 shows a passage from near the end when what is clearly an ostinato beginning in m. 142 (here, measures 143ff. are shown) may also be considered to some extent as an accompaniment to the sparsely moving voices in other parts, the most aurally striking repetitive feature being the repeated descending figure in contralto saxophone. In Example 1.3 the shading of ostinato into 'accompaniment' is even more evident from the figures tied across the bar line creating what in a Romantic context one might well call a 'lilting' triple-time passage which, extending over sixteen bars is, for this piece, a relatively sustained effect. Yet undoubtedly 'ostinato' is in play in the composer's mind, as we see from Example 1.4, a brief interpolation shortly before the music of Example 1.2, and here overtly repetitive, with four aurally prominent strikes of the descending ic5 figure G♯-D♯ low in the xylophone.

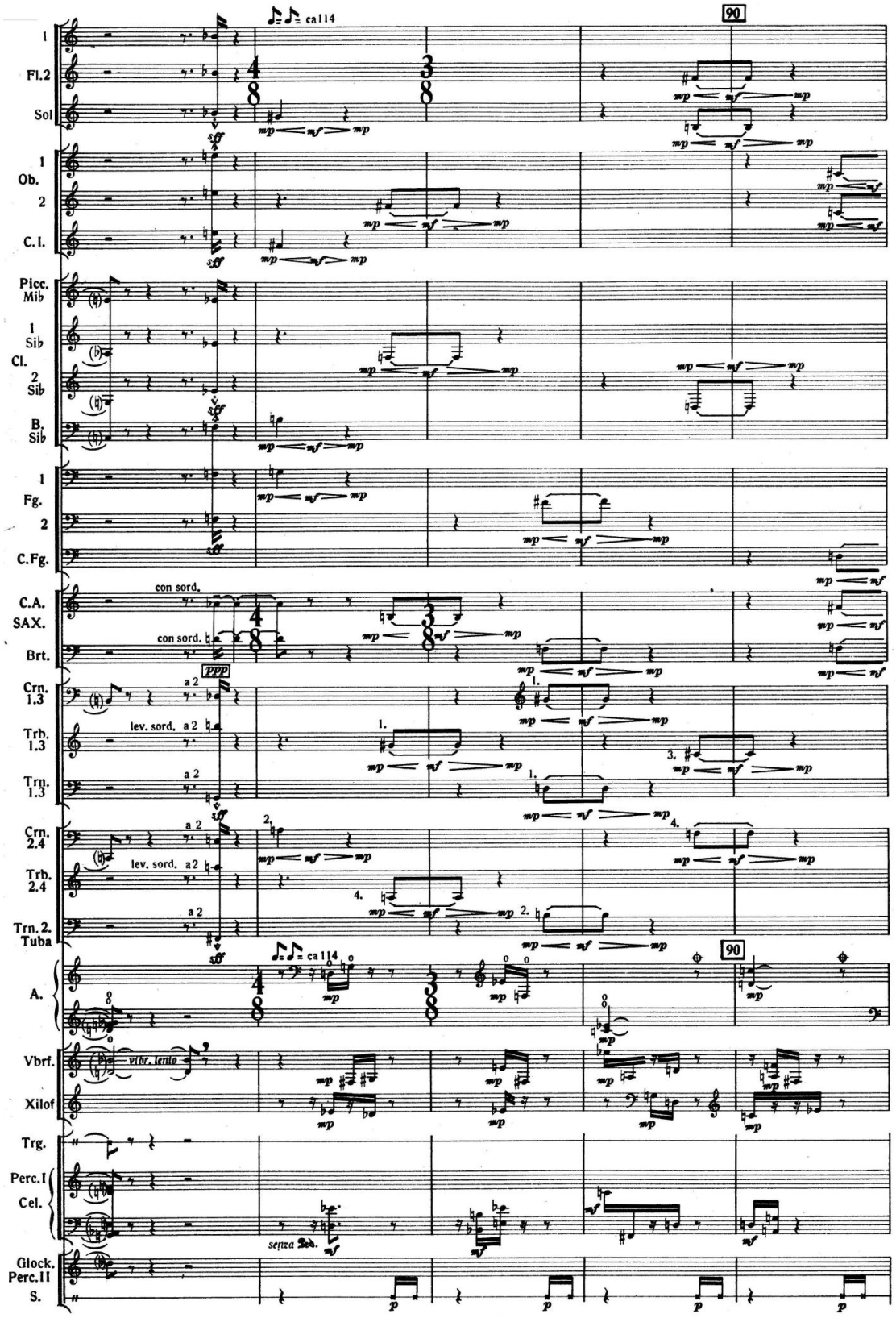
[17] KRAMER, *The Time of Music* (see note 16), p. 20.



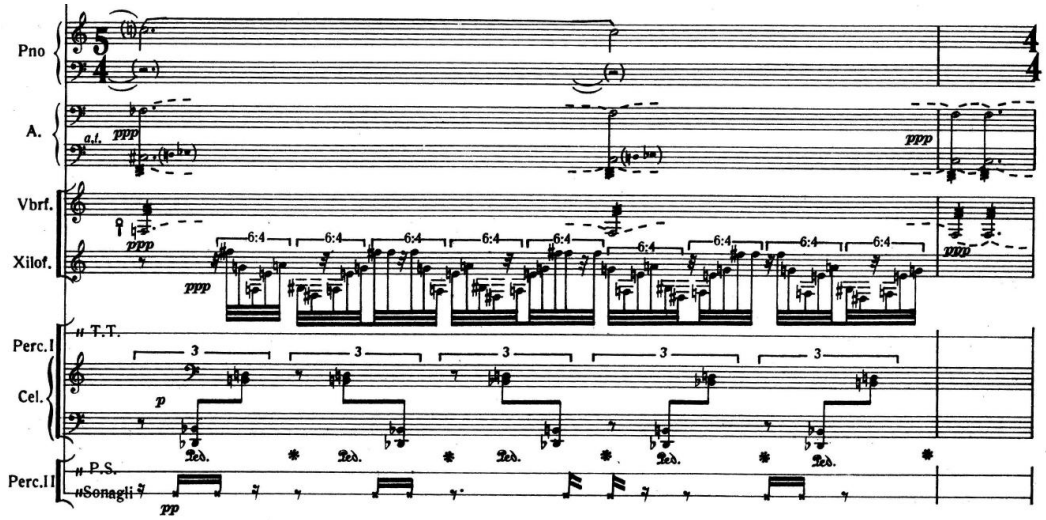
Example 1.1. *Thumos*, Girolamo Arrigo, Heugel S.A. Rights transferred to Alphonse Leduc Editions Musicales.



Example 1.2. *Thumos*, mm. 143ff

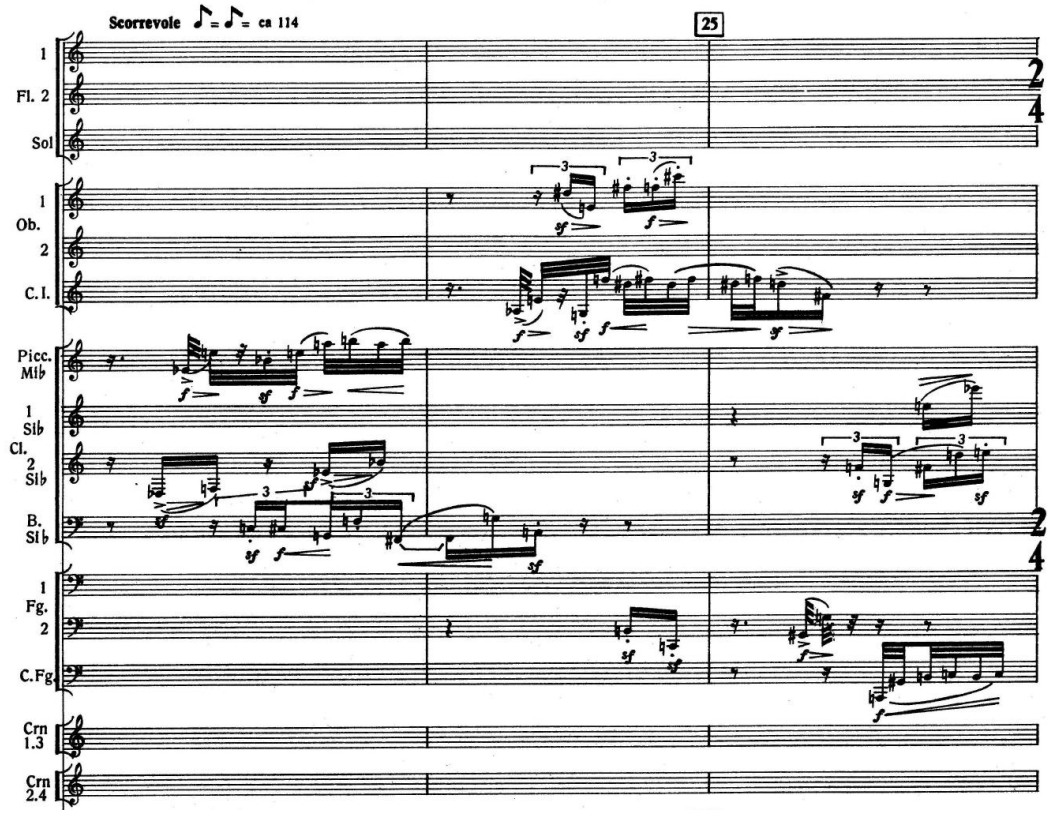


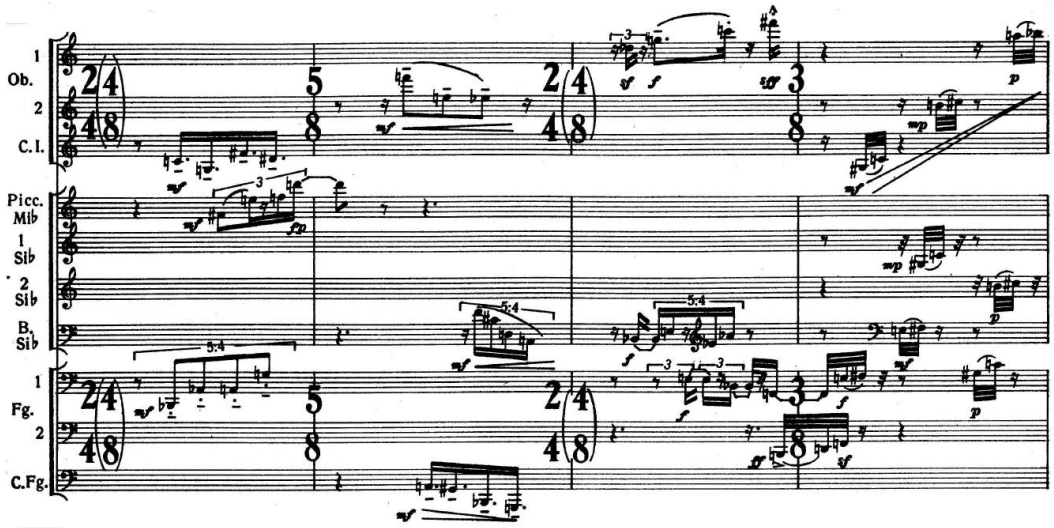
Example 1.3. *Thumos*, mm. 86ff



Example 1.4. *Thumos*, mm. 138-9

All such passages are in a sense extrapolations of typically repetitive fragmentary ideas which stand in *Thumos* alongside the noticeably non-repetitive thematic cells that rather obviously partition row forms. Example 2, the beginning of the third of the eighteen-or-so short sections of the piece, sets out this contrast starkly as the repeating-pitch figures of measures 23-5 pass to the cells in bassoon, clarinet, piccolo, oboe etc. from measure 26:





Example 2. *Thumos*, mm. 23-29

Example 1.1, being the beginning of the piece, may be considered generative of the later examples—it surely would be in an analysis looking for signs of organic, linear-temporal continuity, and the later ostinatos are clustered in the second half of the work, which may suggest some kind of formal significance. Whether such potentially arid music-analytical logic is valuably relevant to our understanding of this aspect of *Thumos* might be a moot point, but it is features of the kind which perhaps Lourenço had in mind with his idea of music moving 'from future to past', music in which we live in 'the abyss of our beginnings'? Lourenço seems to be thinking not so much of a distinction between linearity and non-linearity, but of musical time passing, as he says explicitly, 'in reverse'. If we can follow such an apparently abstruse movement of thought in some kind of music-analytical methodology, it may strike one as altogether more musically interesting than Kramer's programmatic ideas. Lourenço will have been aware of instances in what he calls modern music where there is good empirical evidence for the idea of musical content moving in reverse. Superficially, he could refer to elements of music such as Messiaen's non-retrogradable rhythms, very much a talking point in 1964; musicians of the period were well aware of textbook cases of wholesale compositional retrogression such as in the Adagio, middle movement of Berg's 1925 Chamber Concerto.[18] It seems unlikely, however, that literal regression was on his mind when recording his thoughts about 'immanent eternity'.

[18] David TRIPPETT offers a list of notable cases (p. 523) of mirror-form music from the early twentieth century, and refers to relevant literature on the phenomenon: see 'Composing Time: Zeno's Arrow, Hindemith's *Erinnerung*, and Satie's *Instantanéisme*', *The Journal of Musicology,* 24/4 (2007), pp. 522-80.

More likely, he was thinking about music which moves around a universe of pitch space which was no longer, in his chronology of musical change at the beginning of his century, 'infinite'.[19]

As mediation between musical sound and listener, Lourenço's reflections in the epigraph of this essay on the contrasting temporalities intimated by 'classical' and 'new' music pose a provocative backdrop for understanding music which seems to inhabit or convey aspects of both modes. Where with Arrigo we identified relatively little of the potential interplay between references to musical eras, zeitgeists, and specifically, listening paradigms, Bartók will always straddle rather than transcend, historically at least. Reception of his music throughout the twentieth century was torn between conservative and progressive attributions. These would split repertoire and compositional features into 'two Bartóks', folk vs. modern, or tonal vs. atonal, in response to distinct geographical, political, and aesthetic perspectives.[20] Lourenço's captivating propositions of infinite space and immanent eternity, are as suggestive respectively of goal-directed motion, where music moves or makes us move somewhere, from past to future, and of non-teleological motion inhabiting the intriguing notion of reversed time, from future to past as we have seen in discussion of Arrigo. Thus he invites us, implicitly, to revisit temporality and space in Bartók's hybrid musical idiom as capable of synthesizing, or being pliable to, aspects related both to common-practice tonality and post-tonal modernity.[21]

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[19] Given Lourenço's central preoccupation with the relation between history and phenomenology, we can also speculate about the notion of 'reversed time' concerning some of the historical implications of the listener's encounter with 'new music'. In the backdrop of the 'necessity' (after Schoenberg) that twentieth-century modernist music should be progressive, painfully aware of its historical situation, and in which new composers were obliged to 'invent' and 'propose' the musical languages of the 'future' (think about Schoenberg's famous remark that dodecaphony would 'ensure the supremacy of German music for the next hundred years', see Hans STUCKENSCHMIDT, *Schoenberg: His Life, World and Work*, translated from the German by Humphrey Searle (New York, Schirmer Books, 1977), p. 277), the experience of new music became a radical encounter of a 'future' inscribed in the new musical language with the older musical worlds of the listener. The musical experience of the contemporaneous listener would then amount to coping with new music as 'time in reverse', not only because new music syntaxes tended to efface 'familiar' teleologies and expectations in musical experiences, but also in that new music gradually became familiar and progressively comprehended, as if 'moving towards' and gradually transforming the older musical worlds of the listener, so to speak. However, exactly because the experience of new music transformed the listener's grasp and comprehension of (possible) musical syntaxes, new music could never reach ('in reverse') its 'impossible beginnings', that is, it could not literally undo the listener's progressive familiarity with the new musical syntaxes. The 'evolution', as Boulez often calls this complex phenomenon, of musical 'languages', impelled by 'invention' in new musical thinking, is discussed extensively in Pierre BOULEZ, *Leçons de musique (Points de repère, III)* (Paris, Bourgois, 2005), especially chapter 4: 'Langage, matériau et structure', pp. 111-38.

[20] For the analytical reception of Béla Bartók's music in the historical context of the Cold War, see Danielle FOSLER-LUSSIER, *Music Divided: Bartók's Legacy in Cold War Culture* (Berkeley and Los Angeles, University of California Press, 2007).

[21] The music of Bartók has been considered to synthesize various geographical (East, West), historical (Bach, Beethoven, Debussy), stylistic (Schoenberg, Stravinsky), and syntactical (tonal, atonal) influences. For a context of the attribution of qualities of 'synthesis' (or 'hybridity') as well as that of the 'grotesque', see Julie BROWN, *Bartók and the Grotesque*, (Aldershot, Ashgate, 2007), especially pp. 1-5. For a context of the debate on Bartók's 'synthesis' vs. 'compromise', see Malcolm GILLIES, 'The Canonization of Béla Bartók', in *Bartók Perspectives: Man, Composer, and Ethnomusicologist*, edited by Elliot Antokoletz, Victoria Fischer and Benjamin Suchoff (New York, Oxford University Press, 2000), pp. 289-302.

We referred at the outset to a gulf between aesthetic-historical significance and particular analytical projects as one side of a coin which, when we turn it over, as it were, reveals the potential to interpret musical events both as (objective or inter-subjective) empirical data and as phenomena in or acts of human consciousness. The first of those apparent dichotomies reveals itself particularly in the dimension of time, as we have seen through the inspiration of Lourenço's brief insights thematized and explored above in the context of some central tenets of modern music theory as well as some arguments stimulated by a memorable, if symptomatically largely forgotten composition emblematic of so much of the musical 'other' of its time—a composition the modernity of which remains today, half a century later, bookended not only as it always was by its own historical backdrop against which its modernism was so very apparent, but now, as it looks forward at us, bookended too by what Boulez called the 'evolution',[22] if such it is, of languages in which it is not only unanchored as they pull away from it but which may seem to have come postmodernly completely adrift from its contemporaneous aesthetic. Obviously, claims of that kind could not be further substantiated without detailed evaluations of actual musical structures—which our relatively superficial analytical comments on Arrigo merely suggest rather than execute—and, let it be said, the dimension of time is a virtually impassable threshold for hermeneutic approaches to a work of music. It is in the dimension of musical space rather than time—imbricated though the two clearly must be in actually musical experience—that we can most usefully discuss the second dichotomy, between the empirical and phenomenal; and this is how we shall now respond to that invitation from Lourenço to consider reversibility in its widest possible human context.

Bartók's *Music for Strings, Percussion and Celesta* (1936) is in fact an intriguing case in point of reversible time, stylistically at least, but also structurally, especially in the first movement, which reformulates aspects of Baroque contrapuntal techniques within an early twentieth-century harmonic setting; it coordinates chromatic fugal entries regulated by tonal principles in a highly original and celebrated large-scale scheme, staging the composer's mastery of arch form and synthetic compositional methods. Not only did Bartók's masterpiece captivate generations of listeners and analysts, but it exerted a particular fascination for Lourenço, a confessed self-identity ('my truthful soul').[23] Writing about the piece in 1952, 16 years after its composition, Lourenço sensed a 'mediated'

[22] See above, note 19.

[23] 'My truthful soul: Transfigured Night, Music for Strings Percussion and Celesta, etc. In it there is all that has always destroyed and transfigured me in the great music and there is also this accent that is of my time and of no other'. ['Minha alma verdadeira: Noite transfigurada, Música para Cordas, Percussão e Celesta, etc. Nela há tudo o que na grande música sempre me destruiu e transfigurou e há mais este acento que é do meu tempo e de nenhum outro']. See LOURENÇO, *Tempo da música* (see note 1), p. 153: 'Schönberg, Noite Transfigurada, 12-06-1966'. Bartók's music, which receives a number of entries in the book, is addressed by Lourenço in revelatory terms on a conversation with the book's editor Barbara Aniello: 'In 1951, my brother António, who more than me was up-to-date in modern music issues, render to me the listening of the famous Bartók's *Music for Strings, Percussion, and Celesta*. It was a revelation of another world that was no longer the mystic-religious vision of the time of God, rather it was a time without God, searching for another God that would be

musical world, made from scratch, as it were, if in what Milton Babbitt would refer to as *contextuality*.[24] Lourenço captures—in a series of paradoxes, and intense imagery, strongly empirically grounded, such as 'frozen velocity', 'crystalline architecture of unsuspected purities', 'sonorities connected by a supremely coherent incoherence', 'a tone which in creating itself advances its law like a triangle creating a cone', etc.—the tension between the experience of musical process and its structural conditions and implications. It is a phenomenological effort to cope with or denote music's significance, testimony to his idea that to explain the fascination with music is to explain music itself:[25]

> The world of Béla Bartók is one of stases where only the idea of frozen velocity remains, a scream, a crystalline architecture of unsuspected purities, a perpetual invention of sonorities connected by a supremely coherent incoherence; the world of a vacant universe, only the miracle of his genius forging the laws of a poetic space which he chooses to traverse.
>
> The suggestion is mediated, as a musical space of pure, solitary homogeneity. The universe of a tone which in creating itself advances its law like a triangle creating a cone. *Assimilation to* the universe of the large spaces in paintings by Giorgio de Chirico. A stellar purity, a frozen red, from the confines of sadness, a galactic universe. There is nothing but an ecstatic correspondence of purified forms, thoughts of God at the aurora of a world where feeling awaits the hour of its birth. Just form. Form without color, without light. Pure forms of silence make up a scenario where God is absent.
>
> The end of the first movement is one of the starkest ever instances of the eternal musical universe.
>
> In the closing passage, all the notes, the stellar universe, follow each other's course, approach without touching, even seem to pass each other, but it is always us who pass by. There is only solitude, the most

Music'. [Foi em 1951 que o meu irmão António, que estava mais a par do que eu (em questões musicais modernas), me proporcionou a escuta de Béla Bartók, da famosa *Música para Cordas, Percussão e Celesta*. Foi uma revelação de um outro mundo que já não era esse da visão místico-religiosa do tempo de Deus, era um tempo sem Deus, em busca de outro Deus que seria a Música'.] See LOURENÇO, *Tempo da música* (see note 1), p. 21.

[24] For a discussion of his musical notions of 'contextuality', 'self-referential', and 'self-enclosed' work, see Milton BABBITT, 'The Twelve-Tone Tradition', in *Words about Music*, edited by Stephen Dembski and Joseph Straus (Madison, The University of Wisconsin Press, 1987), pp. 9-10.

[25] 'Sob os nossos olhos (a música é para mim vitral), o milagre musical nasce, morre, ressuscita e destas contínuas metamorfoses uma contínua fascinacão toma conta de nós. Estas (são) de uma beleza profunda. / Explicar esta fascinação e explicar a Música é a mesma coisa'. See LOURENÇO, *Tempo da música* (see note 1), p. 133: 'Hindemith, Thèmes et Variations, 1960'. This position may remind the reader of Adorno's claim that only philosophical engagement can yield up the truth content of Western Art Music (see, for a general explanation, *The Routledge Companion to Philosophy and Music*, edited by Theodore Gracyk and Andrew Kania (London, Routledge, 2014), pp. 392-3); although it might be useful to think of that as a sufficient condition in Lourenço rather than a necessary one, since Lourenço envisages also a fundamentally intuitive engagement as a way to hypostasize musical signification. Undoubtedly, Adorno would empathize with Lourenço's commitment to subjective truth rather than some sort of supposed objective stylistic analysis: see Adorno's essay 'Unfair Intimidation', in *Minima Moralia: Reflections on a Damaged Life* (London, Verso, 2005; originally published in German, 1951), pp. 69-70.

seizing and magical and pure musical solitude of which one may conceive. Only an unprecedented sadness can have plucked such music from the self-consuming silence. [26]

We suggest that the experience of temporality in this music is shaped by the interplay of pitch formations resulting from forward- and backward-oriented processes, as well as relations between processes of differing formal significance. In particular, we focus on three aspects: (1) how the music-discussed, large-scale arch design of perfect-fifth entries creates a real-time multivalent pitch structure; (2) how these multivalent relations are also telescoped into the 'new chromaticism' of each subject statement;[27] and (3) how relations between subject (micro-level) and arch form (macro-level) invoke the organization of certain out-of-time, that is, synchronic, periodic pitch structures, which we call *affinity spaces*.

The interpretation of musical processes proposed here is sustained by a number of conceptual musical diagrams of pitch space. Rather than tentatively 'freezing' the music's temporal processes, the pitch-space diagrams are constructed by attending to the structuring act of, or the structure induced by, musical processes. While some of these diagrams structure in-time events, other diagrams are best understood as out-of-time structures, which attempt to capture essential pitch-space features that come into existence in the work.[28] Both types of diagrams provide conceptual maps for analytical navigations of pitch space that interact with and inform distinct modes of experiencing musical time. By

[26] 'O mundo de Béla Bartók é um mundo de gares onde só resta a ideia de uma velocidade congelada, um grito, uma arquitectura cristalina de purezas insuspeitadas, uma perpétua invenção de sonoridades ligadas por uma incoerência supremamente coerente, de um mundo que é do homem face a um universo totalmente deserto, onde só o milagre do seu génio traça as leis do próprio espaço poético que prefere percorrer.

A sugestão é mediata, de um espaço musical de uma homogeneidade pura e solitária, universo de um tom que se cria avançando toda a sua lei como um triângulo cria um cone. Assimilação com o universo dos grandes espaços da pintura de Giorgio de Chirico. Uma pureza estelar, um vermelho gelado dos confins da tristeza, universo galáctico. Nada existe aí senão uma correspondência extática de formas depuradas, pensamentos de Deus na aurora de um mundo onde o sentimento espera a sua hora de nascimento. Só forma. Forma sem cor, sem luz. Formas puras do silêncio compõem um cenário donde Deus está ausente.

O final do primeiro andamento é dos momentos mais deslumbrantes do universo musical de todos os tempos.

No último movimento, as notas, os universos estelares perseguem-se, aproximam-se sem se tocar, parecem mesmo passar uns pelos outros, mas são sempre nós pelos outros. Só há solidão, a mais espantosa e mágica e pura solidão musical que é possível conceber. Só uma tristeza como nunca houve podia arrancar de si tal música do silêncio que se devora a si mesmo'. Eduardo LOURENÇO, *Tempo da música* (see note 1), p. 88: 2.11 'Béla Bartók, Música para cordas, percussão e celesta, 3-12-1952', emphasis original; the current authors' translation.

[27] For a discussion of Bartók's notion of 'new chromaticism', see note 39.

[28] From the point of view of a general theory of art, Karol Berger discusses the relation between music and the exploration of space as the result of the various relationships formed between parts and the whole. He refers to the 'narrative' and 'lyrical' as the two general poietic forms of composition. See Karol BERGER, *Theory of Art* (Oxford, Oxford University Press, 1999), especially pp. 190-202.

emphasizing the coherence of pitch-space organization, the analytical navigations contribute to imaginary constructions of the movement as a musical work, resonating with Lourenço's ideas about new music and this piece in particular.[29]

A mere decade and a half before Lourenço's essay Bartók had provided his own analytical commentary, briefly inventorying what he considered the main technical (formal and tonal) features of the piece; a detached poietic report, it stands in stark contrast with the intense esthesic engagement of Lourenço's prose:

> First movement in A. On certain principles fairly strictly executed form of a fugue, i.e., the 2nd entry appears one fifth higher, the 4th again one fifth higher than the 2nd, the 6th, the 8th and so forth again a fifth higher than the preceding one. The 3rd, 5th, 7th, etc. on the other hand enter each a fifth lower. After the remotest key—E flat—has been reached (the climax of the movement) the following entries render the theme in contrary movement until the fundamental key—A—is reached again, after which a short Coda follows.
>
> N. B.: 1st: Several secondary entries appear in a stretto, 2nd: some entries show the theme incompletely, that is in fragments.[30]

Bartók's skeletal commentary has been fleshed out by numerous studies examining the piece's original exploration of pitch space and resulting form.[31] Figure 1 diagrams the arch shape towards and away

[29] 'Naturally, in a deep exploration of time and pitch in this repertoire it would be fruitless to try to maintain direct connections with Lourenço's actual ideas, which are motivating rather than prescriptive; nor would it be appropriate in this context to enter into detailed debate with other, certainly fascinating approaches to Bartók analysis which do not share the same ambitions as here'. The notions of in-time and time-out and other criteria for musical explanation are discussed in John RAHN, 'Aspects of Musical Explanation', *Perspectives of New Music,* 17/2 (1979), pp. 72-85. The relation between musical 'process' vs. 'work' and associated modes of experience is explored in BERGER, *Theory of Art* (see note 3), pp. 116-9. Another relevant concept for the present discussion is the distinction between event hierarchies ('hierarchical relationships inferred from a sequence of events') vs. tonal hierarchies ('hierarchical relations that accrue to an entire tonal system beyond its instantiation in a particular piece'); see Fred LERDAHL, *Tonal Pitch Space* (New York, Oxford University Press, 2001), pp. 41-88.

[30] Béla BARTÓK, 'Structure of Music for String Instruments', in *Béla Bartók Essays*, edited by Benjamin Suchoff (Lincoln, University of Nebraska Press, 1992), p. 416 (original written in 1937). For a discussion of this and other descriptions written by Bartók, see Jürgen HUNKEMÖLLER, 'Bartók analysiert seine "Musik für Saiteninstrumente, Schlagzeug und Celesta"', *Archiv für Musikwissenschaft,* 40/2 (1983), pp. 147-63.

[31] The analyses of the first movement that more directly influenced the present article are: Elliott ANTOKOLETZ, *The Music of Béla Bartók: A Study of Tonality and Progression in Twentieth-Century Music* (Berkeley, University of California Press, 1989), pp. 184-90; Robert D. MORRIS, 'Conflict and Anomaly in Bartók and Webern', in *Musical Transformation and Musical Intuition: Eleven Essays in Honor of David Lewin*, edited by Raphael Atlas and Michael Cherlin (Roxbury, Mass, Ovenbird Press, 1994), pp. 59-78; and Jonathan BERNARD, 'Zones of Impingement: Two Movements from Bartók's *Music for Strings, Percussion, and Celesta*', *Music Theory Spectrum*, 25/1 (2003), pp. 3-34.

from the climax on E♭ through a double chain of upper and lower perfect fifths from and to a central focal note A, creating a symmetrical pitch-class space along with an overall asymmetrical large-scale temporal design.[32] The figure also indicates the coordination of focal tones in subject entries (in recto up to the climax and in inversion afterwards) with significant textural and instrumental changes throughout the piece. Note the formal function of tritones A–E♭ and C–F♯: the climatic E♭ (m. 56) stands a tritone away from the opening entry and the closing Coda on A (m. 77), a relation recast in the chromatic gesture aligning recto and inverted subject segments at the end of the coda (mm. 86-8). Each chain of fifths is in turn punctuated midway to and from the climax by a canon at the tritone F♯–C (m. 26 and m. 64).[33]

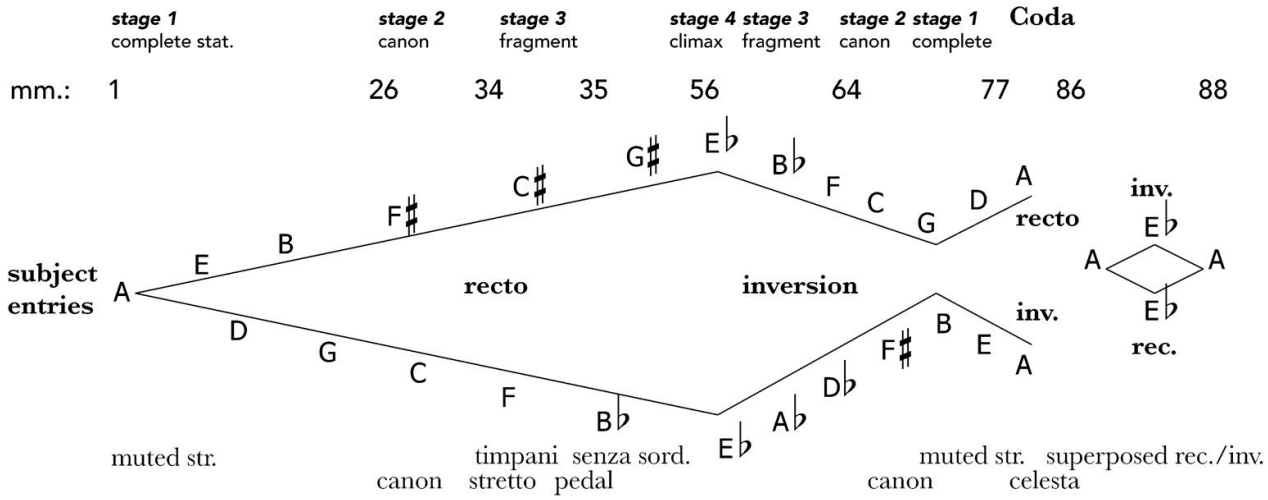


Figure 1. Diagram for pitch-class space and formal design in the first movement of Bartók's *Music for Strings, Percussion and Celesta*

The double arch created by the succession of fugal entries is abstracted and normalized (Figure 2) as a tonal model displaying combinatorial and other relational properties. The focal tones of subject

[32] Claims that the music of Bartók is organized in terms of harmony, rhythm, and form around the (asymmetrical) ratio of 'golden section' stem from the work of the Hungarian musicologist Ernö Lendvai. For Lendvai's proportional analysis of *Music for Strings*, see Ernö LENDVAI, *Béla Bartók, An Analysis of his Music* (London, Kahn & Averill, 1971), pp. 28-9. While many of Lendvai's theoretical claims and analytical observations have been largely contested, the proportions of Music for Strings approximate to a considerable degree golden section rations, including the placement of the climax as well as intermediate articulations. For a keen critique of Lendvai's proportional analyses see Roy HOWAT, 'Bartók, Lendvai, and the Principles of Proportional Analysis', *Music Analysis,* 2/1 (1983), pp. 69-95.

[33] An interesting reversal: A–E♭ and E♭–A are punctuated midway by the tritone (F♯–C at the canon); but also the linear tritone F♯ m. 26 and C m. 64 (and C–F♯) are punctuated mid-way by the climax E♭. This pair of tritones would form what Lendvai refers to as an 'axis tonality', where tones in the same axis would project a given tonal quality (supposedly 'tonic' in this case). For an introduction to the 'axis system' see for instance, LENDVAI, *Béla Bartók* (see note 32), pp. 1-16.

statements in Figure 2.1 combine to produce the 12-tone aggregate four times: twice as complete chains-of-fifths from the opening entry to the Coda section, one in the upper strand 7-cycle, the other in the lower strand 5-cycle; and twice as the coordination of fifth segments in the upper and lower strands, one up to the climax, and the other after it.[34] While Bartók's aesthetic attitudes did not embrace dodecaphonic techniques, or so-called atonality, the combinatorial principle of large-scale design of the first movement of *Music for Strings* resembles in kind, if though not in formal scope or complexity, contemporaneous 12-tone hexachordal combinatoriality techniques.[35]

In addition to these static properties of pitch space, we can approach the tonal model as a dynamic process that reflects various temporal and transformational relations between segments of focal notes before and after the piece's climax. The temporal experience of the arch's symmetrical shape is multivalent, as our musical focus might shift from moving towards a future goal (in which case both the climatic arrival and the arrival on the last entry on A, beginning the Coda, are goals) and moving in reverse, away from a goal (in which case the climax is experienced as mid point of a process that undoes itself or retrogrades to its beginning). Figures 2.2-2.4 attempt to formally capture these processes, which might also be related by the theoretically aware reader to the nearly contemporaneous Schenkerian concepts enshrined in Salzer as prolongation *of* and prolongation *to*.[36] The experience of the forward inexorability of time is suggested by the transpositional relation (Figure 2.2) between fifth-segments within the upper (x) and lower (y) strands before-to-after the climax; in this sense the descending fourths after the climax in the upper strand are a continuing expression of the process of ascending fifths approaching the climax (the opposite occurs in the lower strand).[37] A number of factors after the climatic experience of m. 56, such as the contracting register, and inverted and gradually complete subject statements, contribute to make a past event the defining aspect through which future

[34] Robert Morris's penetrating discussion of the piece points out several features achieved by the fugue model: the 12-tone combinatorial properties, the 'wedge-row' of all-interval series, and Perle's 'cyclic sets'. See MORRIS, 'Conflict and Anomaly in Bartók and Webern' (see note 31), pp. 59-78, at p. 60. Figure 2.1 reproduces Morris's Example 1a, at p. 61.

[35] The notion of combinatoriality related to twelve-tone theory was first introduced and developed by Milton Babbitt. See Arnold WHITTALL, *The Cambridge Introduction to Serialism* (New York, Cambridge University Press, 2008), p. 245. For a pedagogical analytical approach to hexachordal combinatoriality, see for instance Miguel ROIG-FRANCOLÍ, *Understanding Post-Tonal Music* (New York, McGraw Hill, 2008), pp. 195-213. For a detailed account of Babbitt's twelve-tone thinking, see Andrew MEAD, *An Introduction to the Music of Milton Babbitt* (Princeton: Princeton University Press, 1994). For a historical account of the development of twelve-tone theory, see John COVACH. 'Twelve-Tone Theory', in *The Cambridge History of Western Music Theory*, edited by Thomas Christensen (Cambridge, Cambridge University Press, 2002), pp. 603-27; the discussion of combinatoriality appears at pp. 622-3.

[36] Felix SALZER, *Structural Hearing* (New York, Dover, 1962).

[37] It is not suggested that the operations of transposition and inversion have inherent temporal implications. Rather, these operations are primarily used here as formalizations on pitch-space relations that arise from (although to some extent contributing to) the specified temporal experiences.

events are understood. The experience of 'undoing' the paths taken up to the climax requires a reverse switch of upper and lower strands (Figure 2.3). And finally, a germinating approach (Figure 2.4) might interpret the piece's entire tonal model as transformations (by inversion and retrograde) of an initial 6-note segment (x), which is in turn itself generated by the 7-cycle.

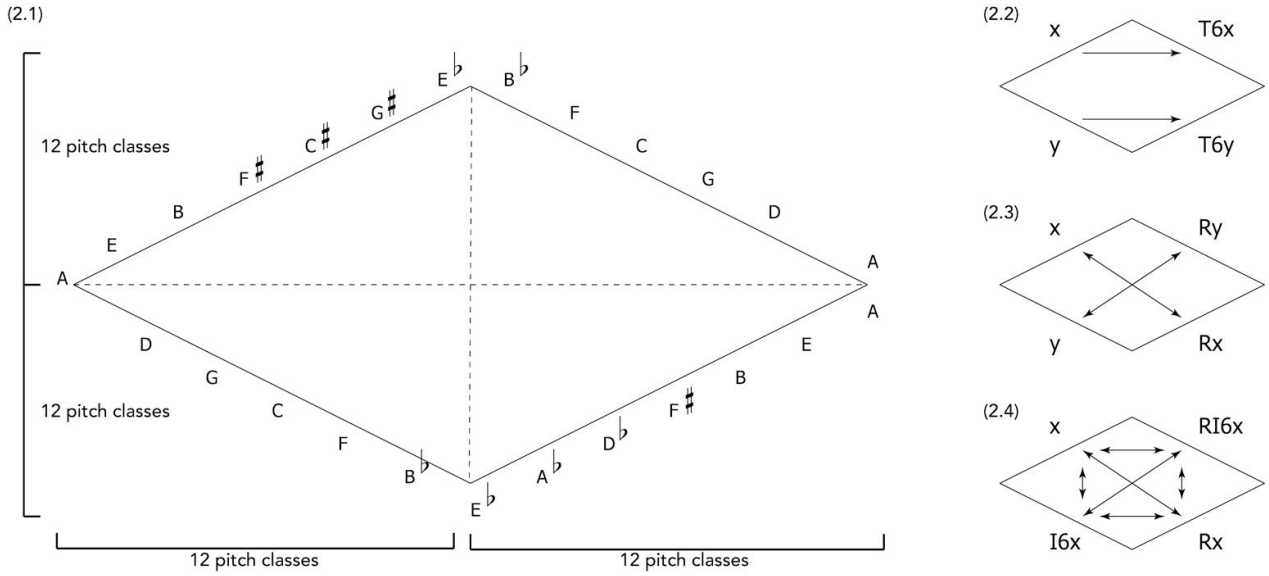


Figure 2. Combinatorial and other relational features of the fugue's tonal model

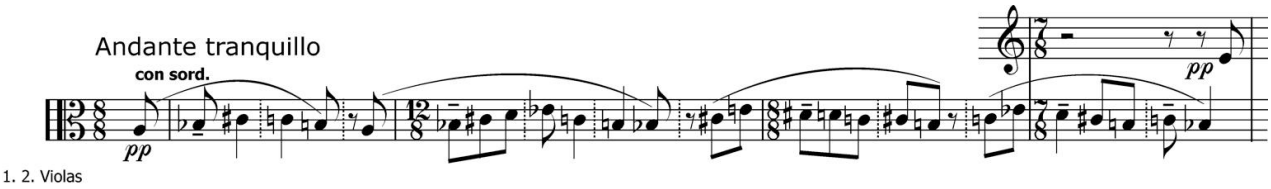
One of the most intriguing aspects of the piece is the relation between the bold, deliberate large-scale tonal plan, advancing and recoiling in fifth steps (perhaps imparting on Lourenço's observation that 'a tone which in creating itself advances its law like a triangle creating a cone') and the melodic turns of the subject statement embodying the characteristic Bartókian 'new chromaticism'.[38] The opening statement 'in A' played by the violas (Example 3) spreads across four phrase segments, chromatically filling in the ambitus of a perfect fifth A–E, reached at the beginning of the 'climatic' third segment. Bartók's proposed notion of new chromaticism implies that we hear individual chromatic tones here hierarchically related only to the focal tone A, bypassing any mediating (scalar) structure.[39]

The four phrase segments are usually labeled as *a*, *a'*, *b*, *b'*, where the letter pairings reflect a slight contrasting character: *a*, *a'* starts with the motive <+1, +3> in the lower part of the fifth ambitus, and *b*,

[38] Bartók discusses his notion of 'new chromaticism' in Béla BARTÓK, 'Harvard Lectures', in *Béla Bartók Essays*, edited by Benjamin Suchoff (Lincoln, University of Nebraska Press, [1943] 1992), pp. 354-92, at pp. 376-83.

[39] In Bartók's words: '[…] the single tones of these melodies are independent tones having no interrelation between each other. There is in each specimen, however, a decidedly fixed fundamental tone to which the other tones resolve in the end.' BARTÓK, 'Harvard Lectures' (see note 38), p. 381.

b' with <+3, -1> in the upper part of the ambitus. While these initiating and contrasting motives help to establish a two-part structure across a melodic peak, the interval pattern <+3, -1, -1> beginning the *b* segment also serves as unifying and forward-oriented element across the entire subject statement (Figure 3.1).[40] The transposition T-1 of what can be heard as a 'recoil' or infill pattern from the *beginning* of *b* to *b'* replicates, by T3, the T-1 from the *ending* of *a* to *a'* (with an important interpolation at *a'*). Moreover, the complex of transpositions (T-1, T-1, and T3) composes out the interval pattern of the unifying motive <+3, -1, -1>. [41]



Example 3. Béla Bartók, *Music for Strings, Percussion, and Celesta*, first movement, opening subject statement "in A". Copyright 1937 by Universal Edition A.G., Wien/UE 34129

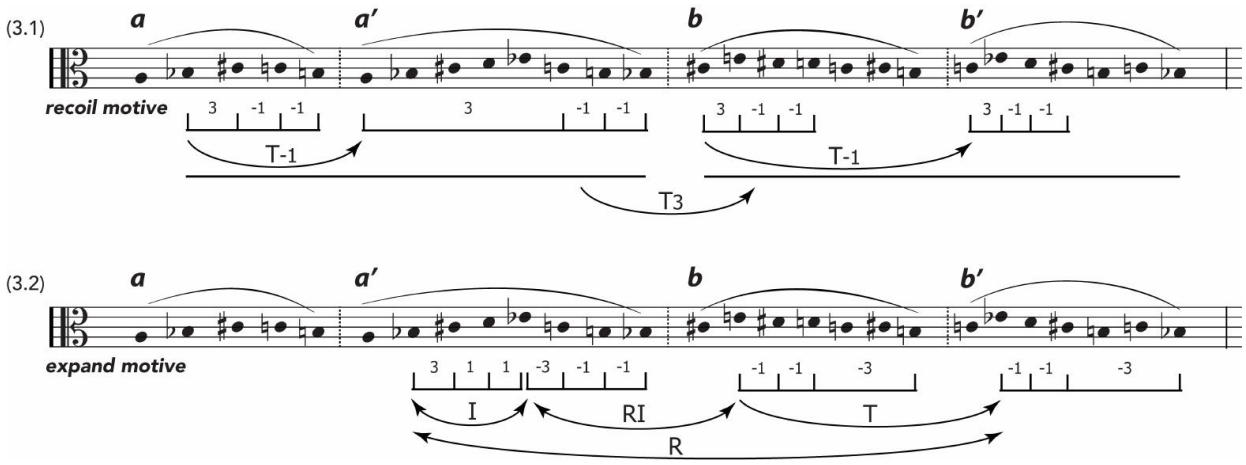


Figure 3. Motivic relations in the subject statement. (3.1) Embedded and composed out "recoil" motives <+3, -1, -1>. (3.2) Embedded "expand" motives <3, 1, 1> (or <-3, -1, -1> and rotations) related by twelve-tone operations T, I, R, RI

[40] Morris considers the entire phrase segment *a* as the germinating motive and proposes that certain operations (insert, behead, addtail, retrograde, and transposition) generate and transform subject (sub)phrases as unifying elements of the fugue subject. See MORRIS, 'Conflict and Anomaly' (see note 31), pp. 62-5.

[41] For a pedagogical analytical application of the notion of "composing out" in atonal contexts see Joseph STRAUS, *Introduction to Post-Tonal Music* (Prentice Hall, 2005[3]), pp. 103-6, and pp. 119-24; for a bibliographic literature sample, see p. 113.

The interpolated pattern <+3, +1, +1> at *a'* creates a related, unifying, 'expand' motive across phrase segments (Figure 3.2). The expand motive shares the pair of semitones with the recoil motive, but the minor third matches the direction (ascending or descending) of the semitones. At *b* and *b'* the pattern interpolates the unique whole tones skipping over to the note closing the phrase segments. As result, the expand motive is reconfigured via all four 12-tone operations (transposition, inversion, retrograde, and retrograde inversion) in the subject statement.

This movement's Coda, which is presumably what Lourenço refers to as 'one of the starkest ever instances of the eternal musical universe' brings a number of significant, synthetic, closural features manifesting intimate harmonic and melodic relations between the large-scale form and subject statements. The closing of the tonal model on A at m. 77 superposes subject statements: the upper register in inversion (Violin 1) and the lower register (Violin 4) in original recto form. The quasi note-against-note counterpoint between recto and inversion complete statements (mm. 77-81) synthesizes (as simultaneity) the change of subject forms before and after the climax (m. 56). Perhaps more significantly, a superposition of statements results in harmonic alignment that privileging the same interval pairs between recto and inversion as the pairings of fugal focal-notes articulated throughout the movement. The reduction in Figure 4 shows how the alignments of the diverging perfect fifths and recto/inversion preferred semitonal motion use the same interval axis (A-E♭) and consequently produce the same aligned interval pairs of sum 6. Evidently, the harmonic quality of the Coda is an expression of the large-scale form's coordination of fugal entries and vice versa.[42]

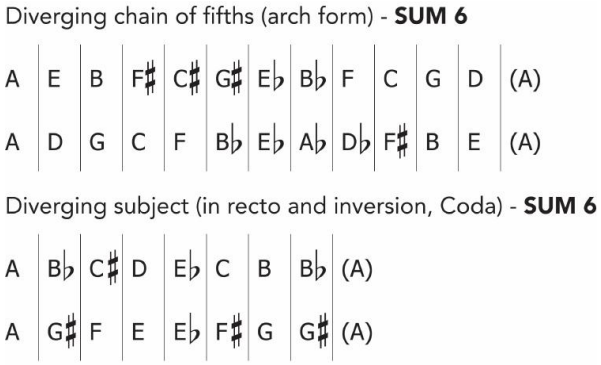
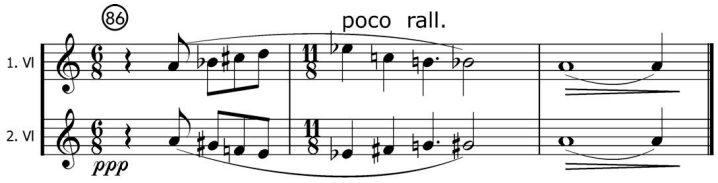


Figure 4. Same pc-pair alignment (sum 6) in both perfect-fifth diverging strands (large-scale form) and semitonal contrary motion of recto/inversion subject statements (Coda), using the inversional axis A/E♭

[42] Symmetrical sum 6 axes in the piece are discussed in ANTOKOLETZ, *The Music of Béla Bartók* (see note 31). Antokoletz also considers the conflict between sum 6 and sum 5 as one the primary conflicts in the piece.

After the superposition of complete statements (recto and inversion) initiating the Coda, a symmetrical diamond-shape gesture brings the Coda to closure (mm. 86-8, Example 4). Based on the *a'* phrase, this gesture telescopes the movement's arch form (A-E♭-A) by finally assigning the subject's recto above and the inversion below, initiating and converging on a single pitch (A4).[43] This local chromatic gesture keeps the harmonic note-pair alignment in a strict note-against-note counterpoint in rhythmic augmentation, resulting in a notated *rallentando* emphasizing the interval-pair qualities while closing off the movement. Since the gesture involves only the subject's *a'* phrase segment, both melodic ascents and descents are structured by the expand motive (Figure 5.1). In addition to the I6 relation between recto and inversion, other transformations of the motive also obtain (Figure 5.2) are transpositions T5, T7 (which also characterize the interval recurrence of divergent perfect-fifth chains); these emerge as forward-oriented relations between similar melodic orientations across the parts, and I11 and I11 emerge as symmetrical relations within each part.



Example 4. Béla Bartók, *Music for Strings, Percussion, and Celesta*, first movement, closing gesture (Coda, mm. 86-8)

The complex of expand-motive arrangements in the closing gesture suggests a periodic pitch pattern, of which the opening A4 is the symmetrical center (Figure 6). This non-octave repeating scalar pattern is periodic at the perfect fourth (T5), with a modular unit of <1, 1, 3>. The registral continuity of the pattern requires that expand motives occurring after the high and low melodic peaks (E♭s) are

[43] Jonathan Bernard's insightful analysis of the piece's pitch space exploration attends to the symmetrical implications of the particular use of pitch register and the way it 'impinges' upon' the notion of pitch class. He explains how the Coda (mm. 82-8) is devoted to not only achieving symmetrical closure, but also of 'fixing the problem' of thematic rearrangement: 'first, the original form of the subject, in pitch space, is below the inversion; second, the As are at the edges of pitch space in use, rather than in the center where they belong'. See BERNARD, 'Zones of Impingement' (see note 31), p. 20. Lourenço's words on what might presumably refer to the events in the Coda are revealing of the switch of registral disposition: 'In the closing passage, all the notes, the stellar universe, follow each other's course, approach without touching, even seem to pass each other, but it is always we who pass by.' In LOURENÇO, *Tempo da música* (see note 26), p. 88. It is not entirely clear whether Lourenço's paragraph refers to the 'closing passage' (Coda) or to the 'last movement'. The authors chose to translate 'último movimento' as the former, since in the previous paragraph of the text and elsewhere Lourenço uses the word 'andamento' to refer to 'movement' (in Portuguese, the words 'andamento' and 'movimento' can both refer to 'movement', as the standard formal division of a piece).

displaced by an octave (using E♭ as pc connector, see double arrow in the figure) from gesture to pattern. Figure 5.3 uses the T5 relations between motives to suggest the continuity of the entire pattern navigating the closing gesture.

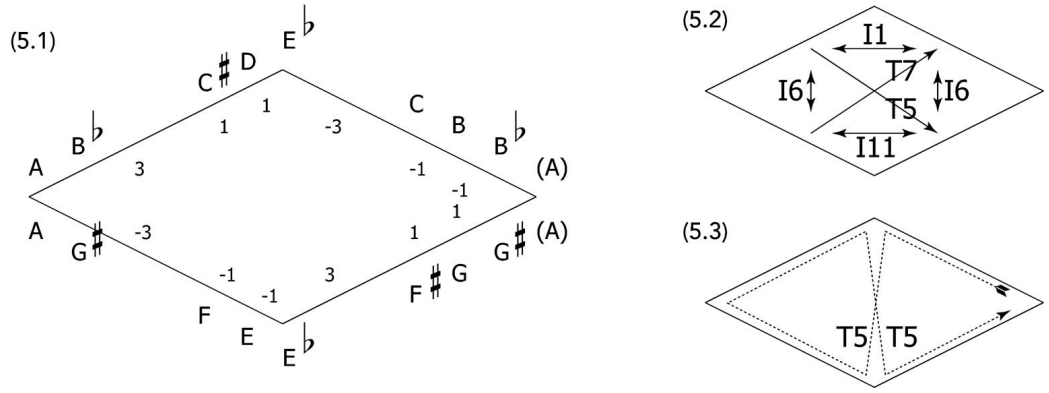


Figure 5. (5.1) (5.2) (5.3) Transformations of the "expand" <3, 1, 1> motive in the closing gesture

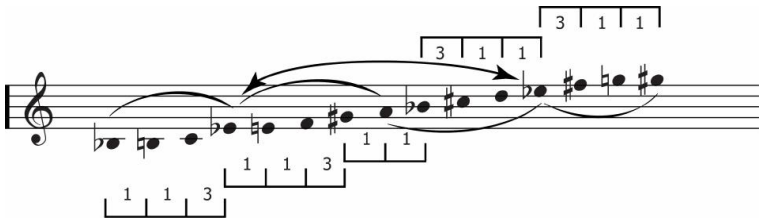


Figure 6. Non-octave repeating, periodic segment of modular unit <1, 1, 3> suggested by the complex of "expand-motive" arrangements in the closing gesture

The pitch-space diagram of Figure 7 abstracts and generalizes the structure of the periodic scale pattern into an *affinity space*. This is a closed, cyclic construct, where the arrangement of note elements is regulated by the (T5 recurrent) modular unit of ordered pitch class intervals <1, 1, 3>.[44] Unlike a scale pattern which specifies a given registral disposition, an affinity space is a flexible construct combining pitch-class and scalar properties. In the formalism that defines the space, each note element stands as an ordered pair of pitch class and modal quality [pc(x), mq(y)], where 0≤x≤11 (x is an integer mod 12), and 0≤y≤2 (y is an integer mod 3). The modal quality integers on the right of the cycle

[44] For a discussion of the structural features, historical resonance, and analytical applicability of affinity spaces for Bartók's polymodal music, see José Oliveira MARTINS, 'Bartók's Polymodality: The Dasian and Other Affinity Spaces', *Journal of Music Theory,* 59/2 (2015), pp. 273-320. The present <1, 1, 3> affinity space is a closed structure because in the 36-element cycle each pitch-class is represented three times (one for each modal quality), and each modal quality is represented twelve times (one for each pitch class).

indicate their correlation with pitch classes. In this arrangement, each pitch class is represented three times (one for each position in the modular unit, under enharmonic equivalence), so that each note element (pc, mq) designates a unique position in the space.[45] The brackets on the left of the cycle refer to the melodic segments of the movement's closing gesture and correspond to the periodic pattern of Figure 6. Together, they constitute a continuous and extended region in the space, where the note element (A, 1) (pitch-class A, modal-quality 1) constitutes the symmetrical axis of harmonic note pairs (of sum 6; see dotted curved lines). The climatic E♭s of the closing gesture are connected by a double arrow between space positions (E♭, 0) and (E♭, 2), an exchange necessary to preserve the region's continuity.[46]

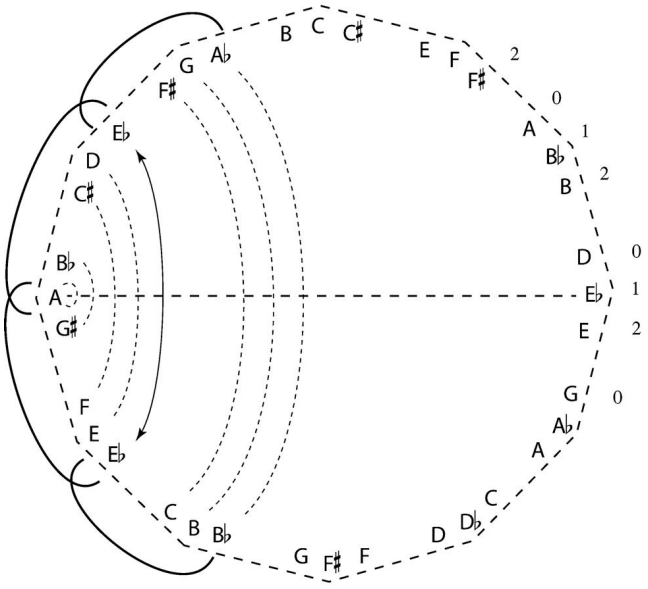


Figure 7. *Affinity space*: a closed, cyclic construct of modular unit <1, 1, 3> that coordinates the properties of pitch class and modal quality. The bracketed region corresponds to the Coda's closing gesture, where (A, 1) is the center of symmetry. Harmonic note pairs of sum 6 are retained in the space symmetry (arrow and dotted curved lines)

[45] The formalism regulating any affinity space is generalized in MARTINS, 'Bartók's Polymodality' (see note 44), pp. 309-12. Edward Gollin presents an original and insightful study of Bartók's use of periodic pitch structures of compound interval cycles ('multi-aggregate cycles') using a related formalism that focuses on the properties and analytical implications for the maximally even distribution of occurrences of the same pitch class in the cycles. See Edward GOLLIN, 'Multi-aggregate Cycles and Multi-aggregate Serial Techniques in the Music of Béla Bartók', *Music Theory Spectrum,* 29/2 (2007), pp. 143-76 and also, 'Near-Maximally-Distributed Cycles and an Instance of Transformational Recursion in Bartok's Etude op. 18, no. 1.', *Music Theory Spectrum,* 30/1 (2008), pp. 139-51.

[46] On the navigating modes and group generators of affinity spaces, see the operations of *transformatio* and *transpositio* in MARTINS, 'Bartók's Polymodality' (see note 44), pp. 278-81. For a historical and theoretical examination of the medieval terms *transpositio* and *transformatio*, and the concept of affinities, see Dolores PESCE, 'B-flat: Transposition or Transformation?', *Journal of Musicology,* 4/3 (1986), pp.330-49, and PESCE, *The Affinities and Medieval Transposition* (Bloomington, Indiana University Press, 1987).

While we have used the closing gesture's arrangement (and "expand" motive in particular) (Figure 5) as inducer of a periodic pattern (Figure 6), in turn generalized into the affinity space (Figure 7), we can also reverse the procedure and observe how the affinity space's structure impinges upon the musical surface, acting as mediator or a privileged, patterned reference. Bartók's idea of new chromaticism is thus reconfigured so that distances of individual notes to the subject's focal tone are not (only) measured in relation to a default ($\mathbb{Z}_{12}$) chromatic space, but rather are also routed through the modular fabric of the affinity space, attending to the close correspondence between particular melodic patterns (music) and note-element positions (space).[47] The analytical act is thus dynamic and reciprocal; it both deduces a space referent from musical input as well as interprets the musical surface through the mediation of a referent.

Figure 8 maps melodic patterns of the subject statement "in A" to the proposed affinity space. The mapping requires some analytical interpretation, in that it relies on the correspondence between the space's unique interval patterns and their occurrence within the subject's melodic segments. Specifically, the unique embedding of the twelve transpositions of interval <3> (minor thirds) in adjacent elements and the twelve transpositions of adjoined <1, 1> semitones entail a privileged mapping when these intervals occur in melodic segments.[48] Figure 8.1 identifies melodic adjacencies of interval <3> within each of the four phrase segments.[49] All remaining adjacent intervals are semitones, including five instances of (a maximum of) two adjoined <1, 1> semitones. The location-specific mapping of <3> and <1, 1> in Figure 8.2 entails splitting the continuous melodic segments (notated in chromatic space in Figure 8.1) into more or less distant segments in the affinity space. This split is signaled by arrows between note elements of the same pitch class, but of different modal quality (i.e., different space locations); whereas in Figure 8.1 the corresponding arrows are circular and point onto the same note. A way to conceptualize and hear the correspondence between the two figures is to think of arrows having a pivoting function between distinct interval patterns: in Figure 8.1, the pivot note coincides with a change of contour, which signals a break in the modular pattern <1, 1, 3> before to

[47] The approach to the relations between musical objects and the space in which they are conceived and experienced adopts Lewin's 'transformational attitude'. Musical space is not absolute, but depends upon relations between objects. The classic work expounding and formalizing this attitude is David LEWIN, *Generalized Musical Intervals and Transformations* (New Haven - CT, Yale University Press, 1987). Lewin writes: '[The transformational] attitude does not ask for some observed measure of extension between reified "points"; rather it asks: "If I am *at* s and wish to get to t, what characteristic *gesture* should I perform in order to arrive there?"' (p. 159).

[48] <3> and <1, 1> are used here as unordered pitch-class intervals (mod 12), i.e., without the plus or minus sign, irrespective of direction.

[49] At the end of *b* and *b'*, <3> skips over the interpolated "cadential" whole tones, as was in the case of the expand motive, cf. Figure 3.2.

after the pivot; and in Figure 8.2, the pivot note connects harmonically close but distinct space locations, so as to trace the continuity of the melodic phrase.[50] The affinity-space modeling of the subject statement shows that the beginning of the third phrase *b* reaches the polar distance (E♭, 1) from the focal tone (A, 1), marked in the figure.[51] In other words, the third phrase *b* reaches not only a melodic climax and contrast to *a* in chromatic space, but also reaches the furthest scalar and harmonic distance in the affinity space.[52] Finally, while the fourth phrase segment *b'* closes the subject statement, it also corresponds to a return in the affinity space to the scalar and harmonic region of the beginning of *a* and *a'* segments.[53]

The affinity-space modeling of the subject's melodic behavior frames a harmonic local motion between the focal tone (A, 1) and its polar distance (E♭, 1) that is reenacted and elaborated in the movement's large-scale tonal motion. We examine now how the fugal entries after the climax, both fragmented and complete, explore both new and previously established affinity-space patterns, resulting in a gradual migration between the polar regions. Figure 9.1 and 9.2 coordinate fugal entries and their affinity-space implications from the climatic E♭ up to the mid-point stretto C/F♯ (mm. 56-68). The local scalar surface of the affinity space is reinforced in new patterns initiated by the fragmented upper entries on E♭ and B♭, which for the first time encircle focal tones with double leading tones and,

[50] This notion of spanning distinct affinity regions within the same phrase segment is actually also typical of tonal practice, where a modulation between harmonically distant regions often occurs within the same phrase.

[51] Interestingly, the D♯ on the third phrase segment is notated as tenuto and falls on a downbeat. Gillies refers to the arrival of D♯ (m. 3) as 'modulation' see Malcolm GILLIES, *Notation and Tonal Structure in Bartók's Later Works* (New York, Garland, 1989), pp. 133-8.

[52] An expression of harmonic distance is the relation between modal qualities of a given pitch class, i.e., the relation between the different positions a given pitch class assumes in the affinity space. For instance, E♭/D♯ is the only pitch class appearing in the three possible positions for the subject statement: (E♭, 0), (E♭, 1), and (E♭, 2). The harmonic distance between these elements is constant and results in the *transformatio* operation *f*: (E♭, 2)→(E♭, 1) and (E♭, 1)→(E♭, 0), each corresponding to a distance of 14 steps in the space. However, while (E♭, 0) is further harmonically from (E♭, 2) than to (E♭, 1), it is scalarly closer distancing merely 8 steps, given the closed and cyclic space, The focal tones (A, 1) and (E♭, 1) distance by 9 *transformatio* stations (f^9), which is the furthest harmonic distance in the space. For discussion and formalization of harmonic distance in affinity spaces, see José Oliveira MARTINS, 'Affinity Spaces and Their Host Set Classes', in *Mathematics and Computation in Music: First International Conference, MCM 2007*, Berlin, Germany, May 18–20 (2007), Revised Selected Papers, edited by Timour Klouche and Thomas Noll (Berlin, Springer, 2009), pp. 499-511, at 505-9.

[53] The registral pattern brought by the Celesta appearing in the Coda suggests that the tetrachord {C♯, D, E♭, E} be split into two partially overlapping chromatic trichords {C♯, D, E♭} and {D, D♯, E}, which also signal the adjoined semitones <1, 1> that characterize phrases *b* and *b'*, and that are imprinted in quasi polar parts of the affinity space. In turn, the ascending pentatonic scale in m. 55 uses a passing tone C♯, i.e., <E, G, A, B, (C♯), D>, which emphasizes the climatic arrival on E♭ at m. 56 through the chromatic trichord {C♯, D, E♭}; this trichord together with {E} initiating the pentatonic ascent results in the sounding tetrachord of the Celesta. Elliot Antokoletz refers to the Celesta tetrachord {C♯, D, E♭, E} as an instance of the symmetrical 'cell X', which he derives from the countersubject on m. 6. Antokoletz sees the symmetrical property instantiated by the Celesta (sum 5) to create a conflict with the symmetry (sum 6) between recto and inverted subjects. See ANTOKOLETZ, *The Music of Béla Bartók* (see note 31), at p. 189.

together with the entry on F, emphasize the <5> (perfect-fourth) modularity.[54] The succession of fragmentary entries gradually expands to an extended region around the focal climatic tone (E♭, 1) until the stretto entries on C/F♯ stabilize locally on the encirclement of the focal tones A and E♭. The tritone pairing of entries thus creates a mid-point articulation, which also refers (via space locations) to both the beginning (E♭, 1) and ending points (A, 1) of the large-scale span.

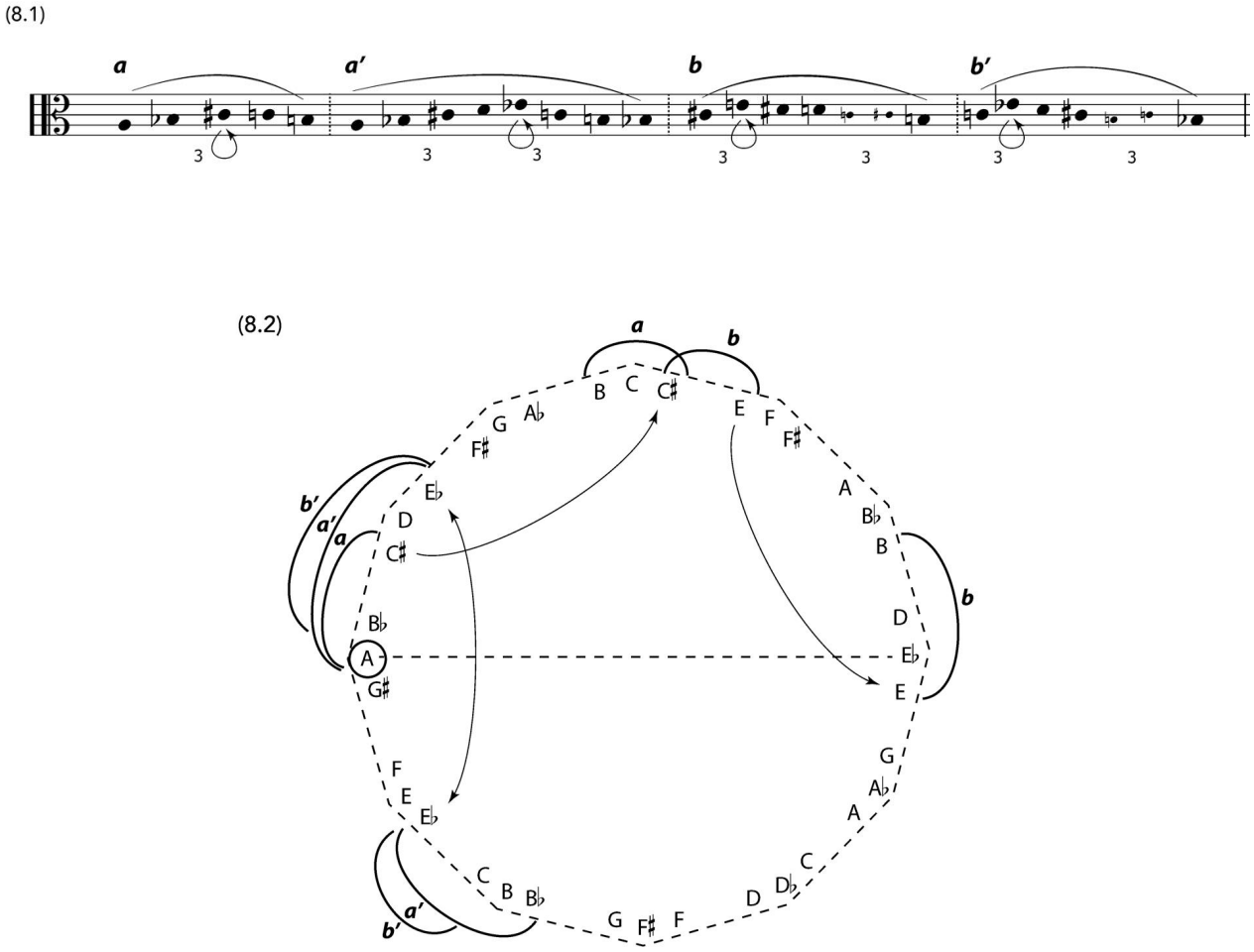


Figure 8. (8.1) Complete subject statement "in A" (recto: a, a', b, b'). (8.2) Affinity-space modeling of the subject statement.

[54] Bartók's compositional procedure of suggesting a pitch center via double leading-tone attraction has been addressed by the notions of 'encirclement', see GILLIES, *Notation and Tonal Structure* (see note 51), and 'disposition pairs', see Charles MORRISON, 'Prolongation in the Final Movement of Bartók's String Quartet No. 4', *Music Theory Spectrum*, 13/2 (1991), pp. 179-96. LERDAHL, examines the prolongational potential of double leading-tone formations in Bartók (see note 29), pp. 333-41. The reverse order of the two encircling notes, up–down on E♭ followed by down–up on B♭, reflect the inverted semitonal associations to the focal tone from recto to inversions.

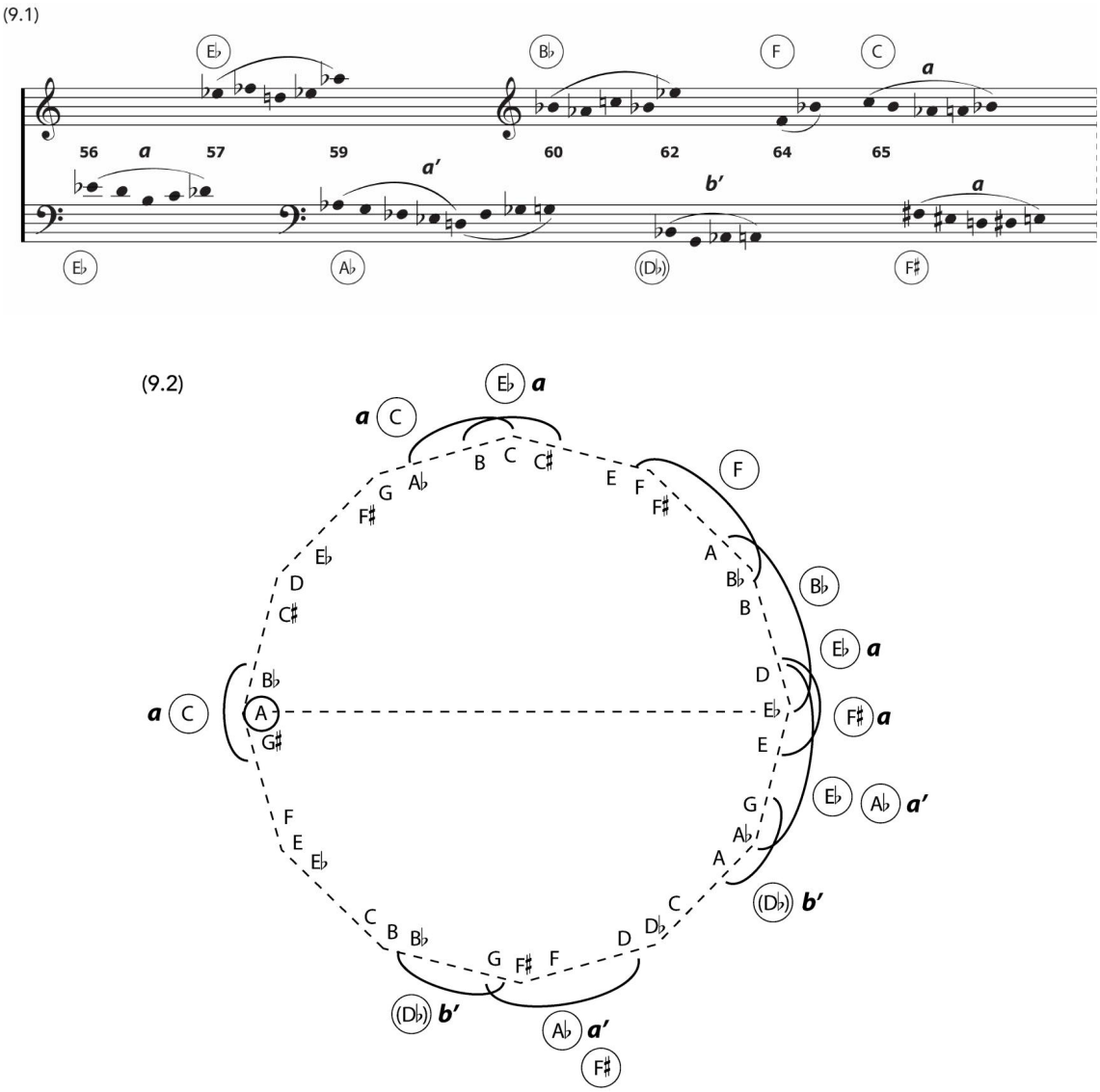


Figure 9. Exploration of the affinity space in inverted subjects after the movement's climax (mm. 56-68)

Figures 10.1-10.3 model the succession of affinity-space imprints for the pairs of entries presenting complete statements on B/G, E/D, and finally A/A (Figure 11). In the course of this progression, both focal tones and space imprints are gradually reconfigured towards a complete symmetrical arrangement. We can think of the music after the climax as a series of harmonic states, beginning with an emphasis on the region around (E♭, 1) and arriving at the Coda on the symmetrical state around (A, 1). Therefore, the arrival of the superimposed (recto and inversion) subjects at the Coda is not only a harmonic

expression of fugal-entry note pairs (as discussed in Figure 6), but also represents the close connection between a (harmonic) state and a (large-scale) process.

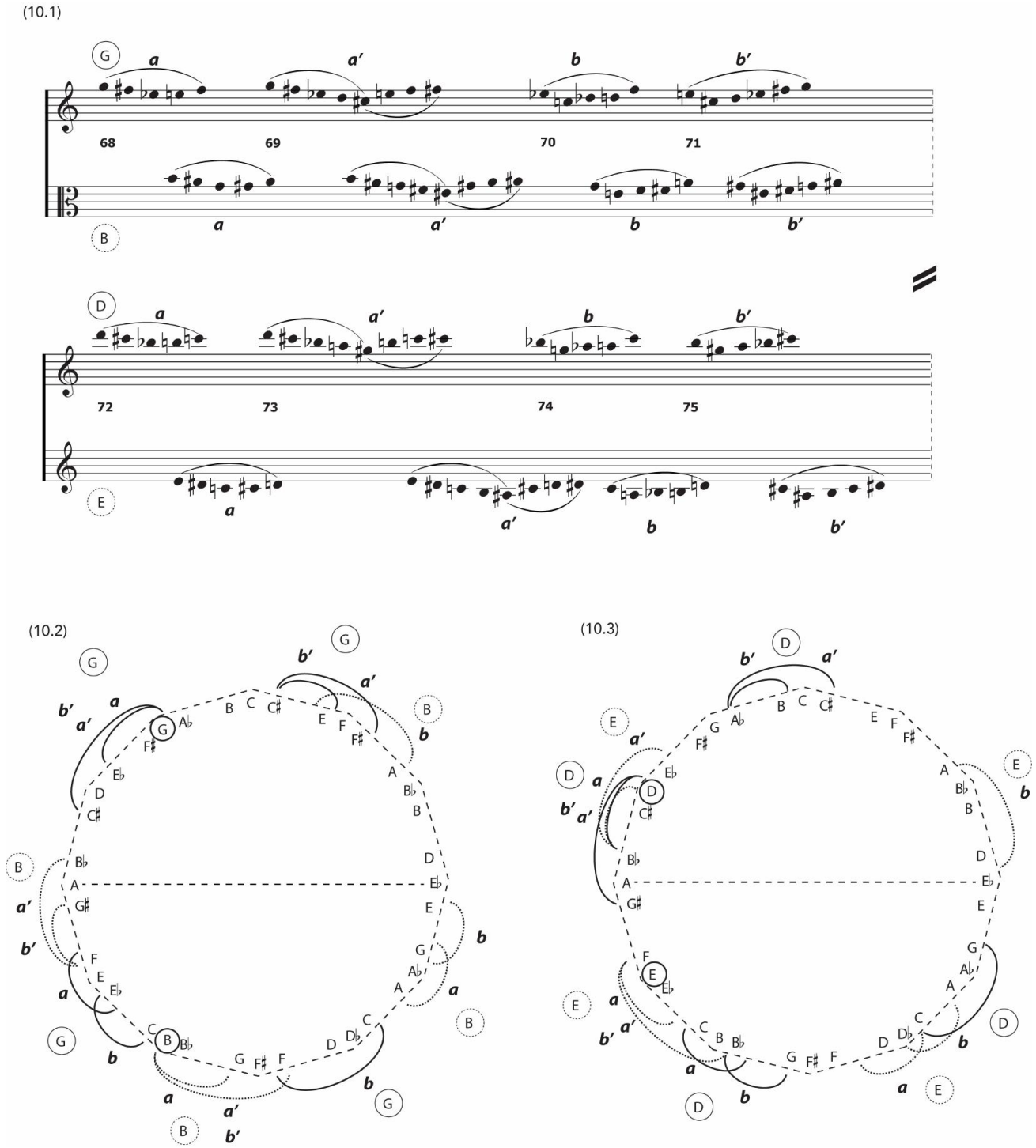


Figure 10. (10.1) Affinity-space inducing patterns in inverted statements. (10.2) Space modeling of statement pairs B/G; and (10.3) statement pairs E/D (10.3)

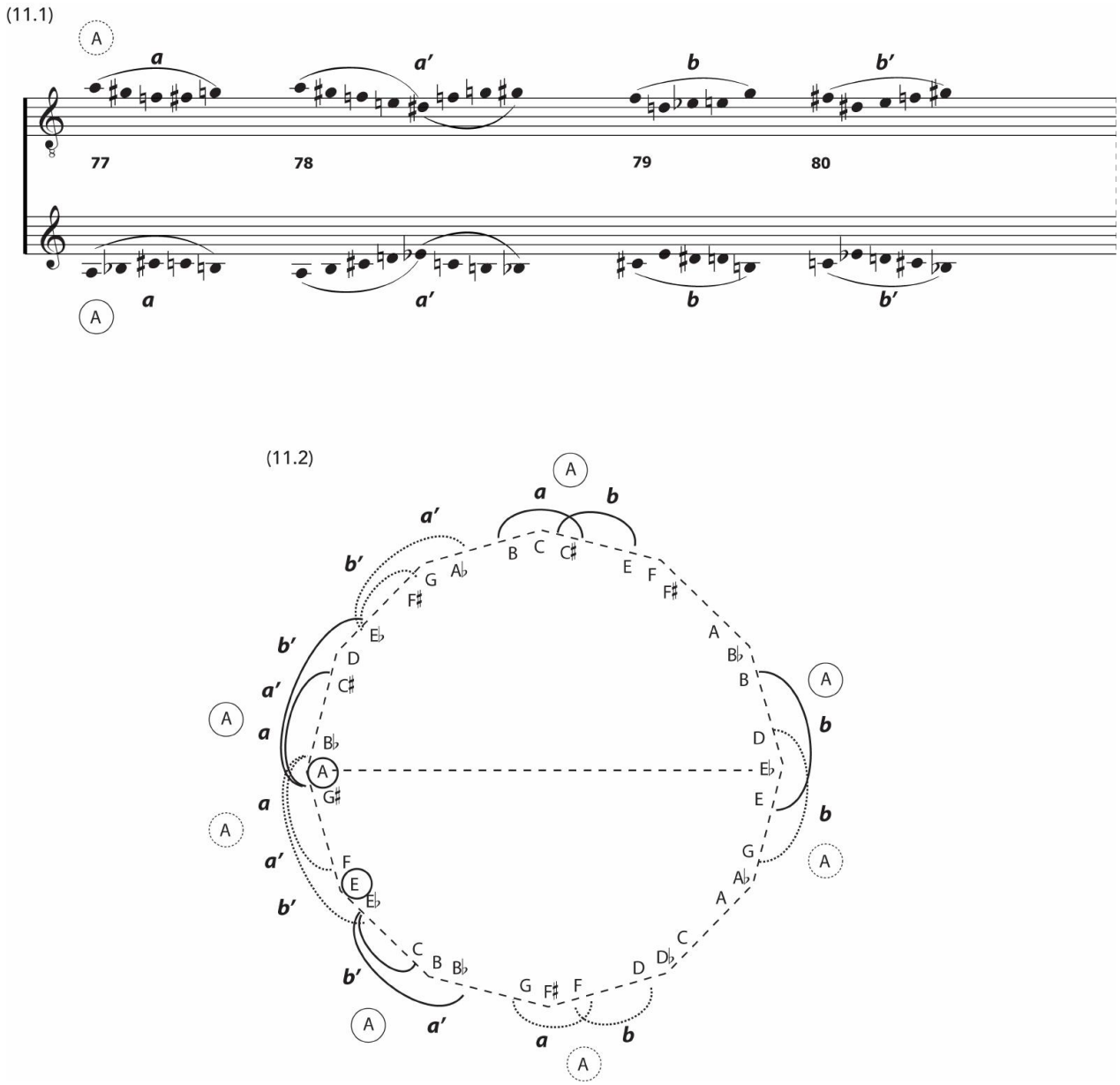


Figure 11. (11.1) Affinity-space inducing pattern suggested by the complete subject statement "in A" combining recto and inverted forms in the Coda (mm. 77-81); (11.2) Symmetrical arrangement of resulting pattern

The analytical motivation for the use of diagrams to model pitch-space relations in this piece reflects distinct (albeit interconnected) modes of conception. The double chain of fifths emerges as an in-time pitch diagram, motivated from left to right in diachronic perspective, structuring the large-scale arch form of fugal entries towards and away from a climatic event, although its structural features give

rise to multivalent experiences of pitch-space relations and time. The <1, 1, 3> affinity space emerges as an out-of-time construct, grasped as a synchronic referential space, whose cyclic and closed structure can nevertheless be diachronically animated and reinforced through particular musical patterns, especially the superposition of subject's recto and inversion in the Coda. To close this analytical exploration, we briefly examine yet another affinity-space construct, which draws from the structure and modes of conception of both diagrams, and as a modest claim for synthesis in the analytical argument.

In order to motivate the pitch arrangement of the space, consider yet again the interval structure of the subject statement (Figure 12). While A, the fundamental tone of Bartók's new chromaticism, is analytically accepted as the statement's focal tone, other pitches (B♭, E♭, and E) also create noticeable polarities. The notes of the tetrachord {A, B♭, E♭, E} signal the lower and upper boundaries of the fifth ambitus of the statement, and occur at most anacrusis-downbeat pairings as well as beginning and ending of phrase segments.[55] Interestingly, the climax of the piece on m. 56 uses the set {E♭, E, B♭}, which together with the pedal note A in the previous measures also highlights the tetrachord. Figure 13 presents a <1, 1, 5> affinity space, which embeds and stacks (0167) tetrachords (bracketed in the figure) overlapping by single-note elements. The stacking of (0167) models the succession of fugal statements, which overlap minimally the chromatic ambitus in adjacent fifths entries. The <1, 1, 5> affinity space thus elaborates on the double chain of fifths, retaining its modularity (7-cycle), and its pertinence in modeling the piece's arch form. On the other hand, its structural resemblance to the <1, 1, 3> space highlights the adjoining semitone at the local level, while inverting the placement focal-tone pairs.

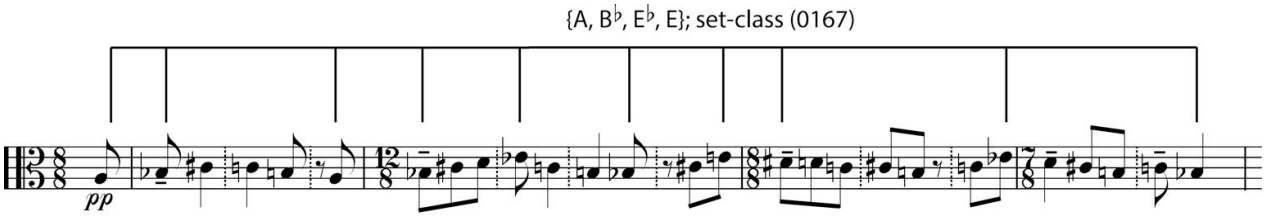


Figure 12. Emphasized (0167) {A, B♭, E♭, E} in the subject statement and in the climatic passage (54-6)

[55] Morris explores the strong polarity and conflict created by B♭ on the focal tone A. See MORRIS, 'Conflict and Anomaly' (see note 31), pp. 65-70.

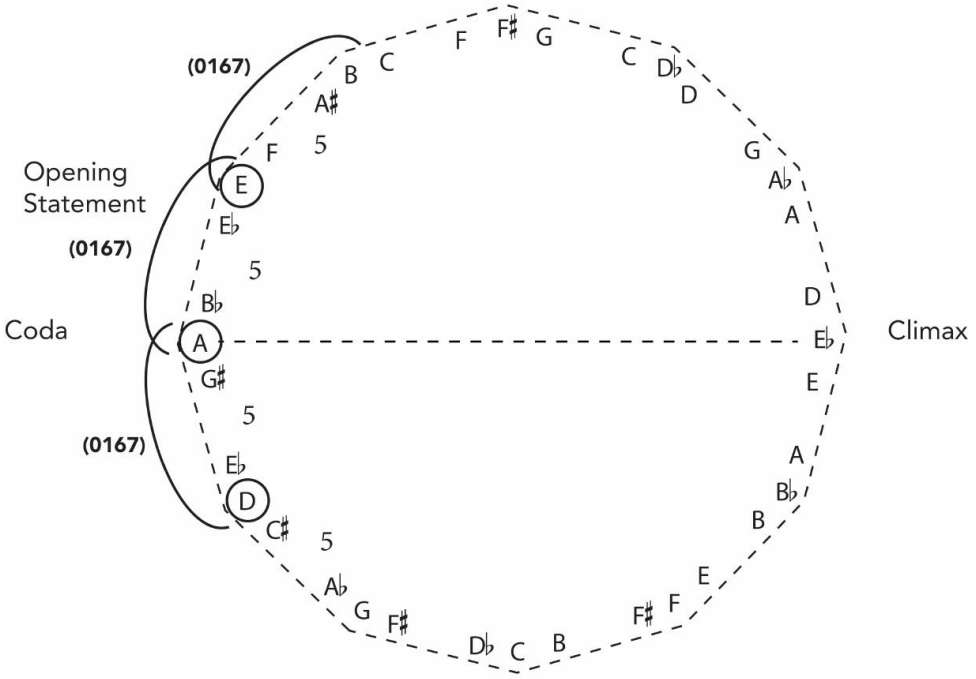


Figure 13. Affinity spaces <1, 1, 5> induced by the emphasized (0167) stacked in perfect-fifth entries throughout the movement

At the local level, both affinity spaces are suggested by aspects of the fugue's subject: the <1, 1, 5> cycle stacks the (0167) tetrachordal skeleton of adjacent fifth entries and the <1, 1, 3> cycle is built on the combination of recto and inverse arrangements of expand motives. The encircled focal tones in each space are related by I6, but this operation does not induce an integral transformation between all note elements between affinity spaces. Rather, the spaces are related via a *progressive transpositional network* (Figures 14.1 and 14.2). The network stands as a macro structure—akin to the relation of interval cycles in Berg's 'master array'—that coordinates six affinity spaces, which differ from each other by a constant variation of the cycles' interval of modularity.[56] Figure 14.1 presents a portion of the six affinity cycles vertically aligned (a-f). All cycles feature adjoined semitones <1, 1> within each

[56] Berg's 'master array' of interval cycles was first discussed in George Perle 1977, based on a construct designed by Berg included in a letter to Arnold Schonberg in 1920. See PERLE, 'Berg's Master Array of the Interval Cycles', *The Musical Quarterly*, 63/1 (1977), pp. 1-30. *Transpositional networks* are pitch-space constructs, which explore variations on the interval structure of the neo-Riemannian *Tonnetz*. Martins discusses the generation and analytic relevance to some twentieth-century harmonic processes of three types of networks: *homogeneous*, *progressive*, and *dynamic*. See José Oliveira MARTINS, 'Interval Cycles, Affinity Spaces, and Transpositional Networks' *Mathematics and Computation in Music - Third International Conference, MCM 2011* (Paris, France, June 15-17, 2011). Proceedings. Lecture Notes in Computer Science 6726, (Springer 2011), pp. 126-39. For a discussion on the historical precedence, structural properties, and generalization of the new-Riemannian tonnetz, see Richard COHN, 'Neo-Riemannian Operations, Parsimonious Trichords and Their Tonnetz Representations', *Journal of Music Theory*, 41/1 (1997), pp. 1-66.

modular unit, but the size of that unit varies across spaces by a constant value of +2 (i.e., modular units of sizes 5, 7, 9, 11, 1, and 3, mod 12). The <1, 1, 3> and <1, 1, 5> cycles are featured on the left of the network as (a) and (b). Since the <1, 1, 7> cycle (c) and the <1, 1, 1> cycle (f) feature intervals <9> and <3> as modular units, the spaces produce only four different focal tones.[57] Figure 14.2 abstracts the structuring intervals of the affinity spaces: vertical pitch-class intervals indicate modular unit size and horizontal pitch-class intervals indicate differences between focal tones in neighboring spaces. The area inside the dotted line corresponds to the portion of spaces presented in 14.1.

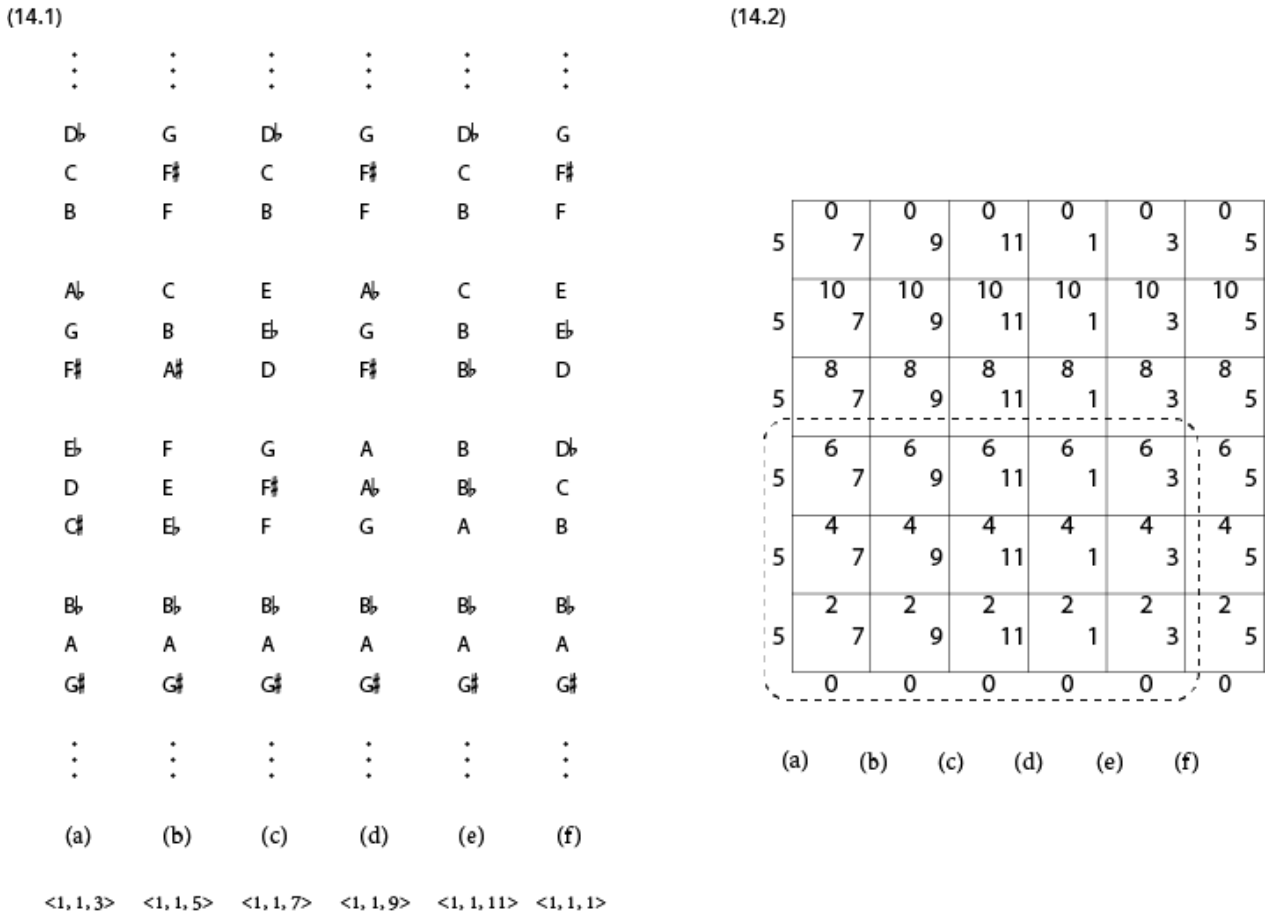


Figure 14. Progressive transpositional network

[57] Some of these affinity configurations are at times emphasized by trichordal arrangements in the piece. The passage of the E♭ entrance up to the climax (mm. 44–55) includes a few instances that suggest some of the cycles: cycle (c) is suggested on m. 44 (violin 1and violins 3,4) and mm. 45–46 by the bass pattern; cycle (f) is suggested in mm. 52–55 by the trichordal phrasing of the chromatic descent.

It is not by chance that our studies here have concentrated on thoughts about musical time in the peak period of Western art music's modernist phase, which was of such contemporaneous interest to Lourenço—an interest that, let it be said, he did not apparently maintain after contemporary composition entered its postmodern phase. The middle years of the twentieth century were very much his 'time', as it were, not surprisingly for a person born in 1923 and obsessed, in a most healthy sense, with understanding contemporary creativity in all its forms. With his intense care for matters Portuguese he was naturally partly obsessed with what we should nowadays probably call the 'glocalized' phenomenon of *tempo português*, that is, 'Portuguese time';[58] but Lourenço was vitally alive to other cultures and modes of thought, as his writings on music amply testify, and here we have seen him musing on musical modernism through trenchant if aphoristic writings which convey the experience through modernist composition of an unprecedented use of—if we may put it this way—time as a kind of space, time as in fact multidimensional. There is a remarkable empirical boldness in his intention to carry his reader with him in such a leap of the critical imagination. Perhaps with a composer like Arrigo, nowadays non-canonical, indeed virtually unknown, a reading as decisive as Lourenço's is always in danger of seeming idiosyncratic; after all, a score like *Thumos* remains relatively marginal, and unsurprisingly resistant to contemporary music-analytical explanation. Yet Bartók, one might say, is another story. Music which is now regarded as 'classic' and in many senses unproblematic came over to Lourenço as fundamentally modernist, a site of 'supremely coherent incoherence; […] of a vacant universe' of which we have sought to explore the pitch space, in a way which stands apart from the recurrent stylistic discussions in the Bartók literature, to try to understand how it engages with the constraints of the chromatic universe. While we should avoid being sentimental about old modernism's modern-ness—not always seeking to reconstruct any shock of the new, which was but one passing feature of an era's masterpieces—nevertheless Lourenço can remind us that there are still unusual stories to be told about music as old to us, now, as J.S. Bach's music was to Mozart.

[58] For the Anglophone reader, an instructive source on Lourenço's thinking is Carlos VELOSO, 'A Call for Poets: Eduardo Lourenço in his Labyrinth of Images' (Ph.D. dissertation Comparative Literature, New York University, 2008), p. 140.

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